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Sick with stress due to childhood schemas? Associations and potential preventive measures derived from a Danish client sample.

Sick with stress due to childhood schemas? Correlations and potential preventive measures derived from a Danish client sample.

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"What you do with your result in this dissertation is that you unfold the whole person again."

(Ylva Lisesdatter)

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Acknowledgment

This Dissertation is like a beautiful handcrafted weaved carpet, with lots of small weaving mistakes, but it doesn´t matter, it just makes it even more unique and beautiful.
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English abstract

According to Young, perception, emotion, and behaviour depend significantly on schemas acquired during childhood. While often functional in childhood (e.g. attachment, obedience/subjugation), these schemas are maladaptive for adults. Psychotherapy uses schemas to explain and treat maladaptive emotions, thoughts, and actions. In this study, 100 psychotherapy patients were investigated using the validated Danish version of Young's schema questionnaire YSQ. Moreover, duration and progress in the psychotherapy were considered. 50 controls, healthy or at least not in psychotherapy, served as a reference. The hypothesis that especially three schemas are connected to later psychotherapy was fully confirmed: self-sacrifice, unrelenting standards, and approval seeking, were significantly higher in the patient compared to the control group. The cross-sectional character of the study and missing longitudinal data allow only cautious consideration of causality. Nevertheless, the present data show a strong relationship between unhealthy cognitive schemas and being in psychotherapy for a stress-related condition, the first time in a large Danish sample. Consequences for society are discussed and prospects for future research are given.

German abstract

Nach Young wird unser gegenwärtiges Empfinden und Verhalten geprägt von in der Kindheit erworbenen Schemata. Die Schematherapie geht davon aus, dass sich auch gestörtes Verhalten und Erleben auf der Grundlage der in der Kindheit noch funktionalen (z.B. Gehorsam/Unterwerfung oder Trennungsangst), aber in der Erwachsenenwelt maladaptiven Schemata entwickelt.

In einer Querschnittsuntersuchung wurden 100 psychotherapeutisch behandelte Personen mit dem Schemafragebogen von Young in der validierten dänischen Version befragt. 50 gesunde bzw. zumindest unbehandelte Personen dienten als Kontrollgruppe. Verlauf und Dauer sowie klinisches Bild der Psychotherapien wurden darüber hinaus berücksichtigt.

Die Hypothese, dass insbesondere drei Schemata, nämlich Aufopferung, Anspruchshaltung und Streben nach Anerkennung, in der Gruppe der behandelten Personen signifikant stärker ausgeprägt sind im Vergleich zu der Kontrollgruppe, wurde vollumfänglich bestätigt. Da keine Messwiederholung vorliegt, muss bezüglich der Kausalität entsprechend vorsichtig interpretiert werden. Dennoch zeigen die Daten - erstmals in einer großen dänischen Stichprobe –, dass der vermutete Zusammenhang zwischen maladaptiven Schemata und psychischer Gesundheit besteht. Die sich daraus ergebenden Konsequenzen für den Umgang

mit psychischen Störungen in unserer Gesellschaft werden diskutiert. Anforderungen an die zukünftige Forschung werden aufgezeigt.

Introduction

Preface – how did this start?

After I got my M.Sc. in Psychology in 2008 for a study on organizational culture after a merger, I took a post-masters specialist degree in psychology Psy.S. in Denmark. During this period, I was initiated into the third wave of cognitive psychological treatment. The third wave psychotherapies comprise a heterogeneous group of treatments that includes acceptance and commitment treatment, behavioural activation, cognitive behavioural analysis system of psychotherapy, dialectical behavioural therapy, metacognitive therapy, mindfulness-based cognitive therapy, and schema therapy (Kahl et al., 2012). This dissertation originated from schema therapy as established by Professor Jeffrey Young (Edwards & Arntz, 2012). He started to develop this method and the questionnaires in the mid-1980s. It was developed for people with personality disorders e.g., Border Line. Schema therapy got my interest, because it combined looking at the present, for example, the cognitive thinking, and the past, i.e., the experiences during childhood and youth which impact adult life.

During the time I took this post-master specialist degree, I was working as a full-time organizational psychologist. Here I got an insight into how organizations work, which problems they face and the consequences for the employees. Besides this job, I started up my own psychotherapeutic practice in 2010. Many clients visited, because they felt sick with stress. I started getting more knowledge about stress and the consequences of stress.

I was wondering, if and how stress and schemas are connected, but it was first when I became very sick with stress myself in 2013 that the idea arose to find out, whether people who get sick with stress, had developed unhealthy schemas in their childhood.

It took me 5 years to recover from stress becoming the person, I am today, and I could recognize as "me" from before the unhealthy stress took over. Life became completely meaningless, and I was not able to feel any joy or happiness. My brain was "broken", as Dr. Mark Hymen calls it (https://sciencebasedmedicine.org/broken-brain/). I had "lost" both, my short- and long-term memory. I was not able to concentrate, I slept terrible, there was a total lack of energy, I lost the contact to myself, I could not feel my body and head, they were "disconnected", I got depression symptoms, and I got anxiety. And because of all this, I lost self-confidence and self-worth. I lost faith in believing that I would be ok again someday; it was the feeling of having lost myself completely. This led me to the observation that the

majority of my clients also asked themselves: WHY did I get sick with stress? Do I have anything in common with other people that get sick with stress?
Figure 1 depicts a simple model trying to cover a very complex theme: STRESS.
It illustrates different levels and factors impacting the individual's level of stress and may cause sickness due to stress.
The main focus in this dissertation is the individual, but society and organization will be touched briefly as well, because those two areas also have an impact on the individual's stress and life. Thus, they contribute to getting sick with stress.

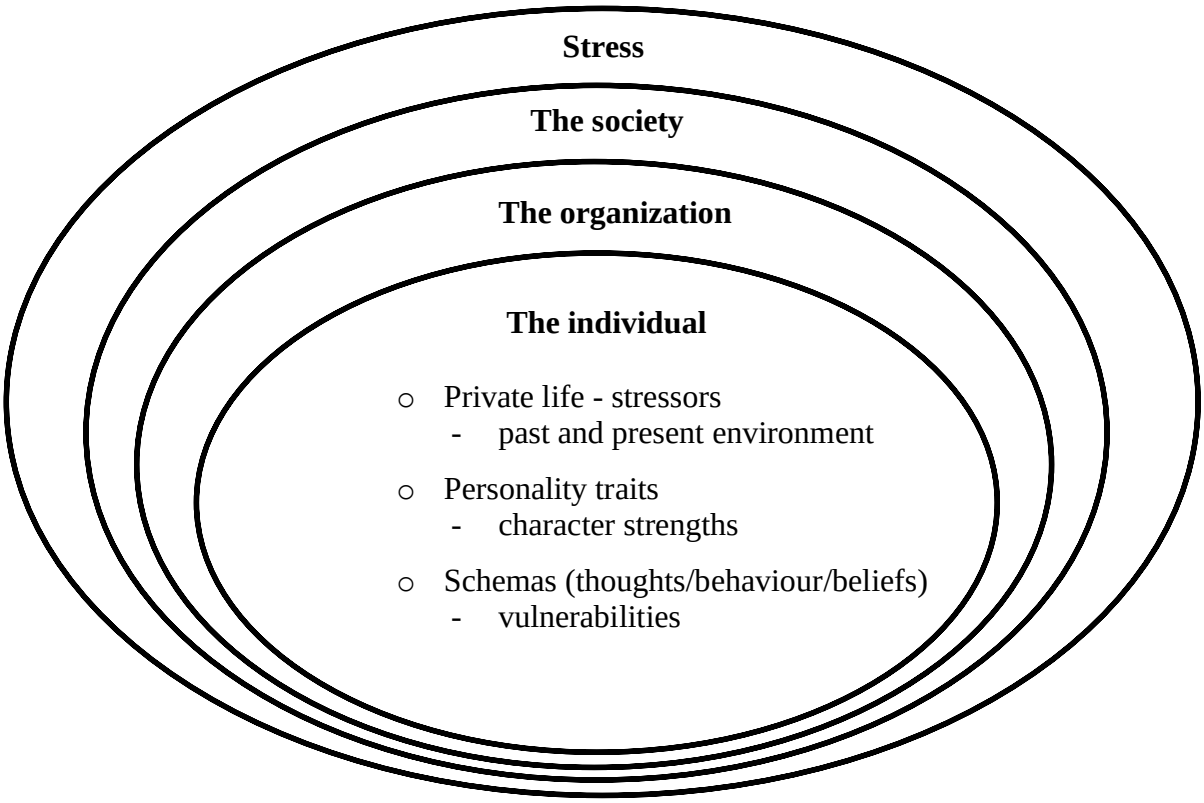

Figure 1. Underlying model of the dissertation focusing individual schemas.

The following chapters, after the introduction and the definition chapters, will look at stress from the perspectives above. Stress models with focus on individual development will be introduced.

Stress…

> Stress-related mental disorders are the most prevalent and cost-intensive disorders of our time. (Kunzler et al., 2018)

Too many people get sick with stress in Denmark and worldwide. This has huge personal and also economic consequences for organizations and the society (Vogt et al. 2010). Incidences of stress related diseases increase and/or receive more attention than ever before. Some citations to underline this are:

"Stress-related disorders are leading causes of long-term sickness absence" (Gémes et al., 2019).

"Stress has a cost for individuals in terms of health, well-being and job dissatisfaction" (Ghasemian et al. 2017).

It is not only when people already are sick that the problem with stress arises. People who are not yet sick with stress but have poor wellbeing and burnout, perform worse at work (Hall et al., 2016).

The stress problem has to be solved, but how? According to the Danish National Health Profile (Sundhedsstyrelsen, 2018) the proportion of Danes with a high level of stress has increased from 20.8% in 2010 to 25.1% in 2017. The proportion of high stress levels is higher among women (29.0%) than among men (21.0%). High levels of stress are particularly prevalent among women in the age group 16-24 years (40.5%), among the unemployed (47.0%), early retirees (55.6%), and others outside the labour market (54.6%). In the period 2010 to 2017, there was an increase of 4.3 percentage points in the proportion of high level of stress (Sundhedsstyrelsen, 2018). But do the above numbers show the real numbers of people that are sick with stress? In 2016, Denmark was the Happiest Country in the WORLD. In 2020 Denmark had dropped to rank 5 (see https://worldhappiness.report/). It is worth noticing the mismatch – that there is this increase in the amount of people that get sick with stress in Denmark and at the same time Denmark is in the top 5 of having the happiest people in the world. How is that possible? Figure 2 is showing the number of people per 1,000 inhabitants, who redeemed at least one prescription for a drug in the group of psychotropic drugs. It shows that over the years**,** benzodiazepines and antidepressants have been the biggest sellers in Denmark. Benzodiazepines are preferably given against anxiety, as sedatives and as

sleeping pills, while antidepressants are preferably given against depression and anxiety (https://sundhedsdatastyrelsen.dk/da/nyheder/2019/medstat_psykofarmaka_101219).
In the following chapters it will be shown that stress, depression, and anxiety are connected.

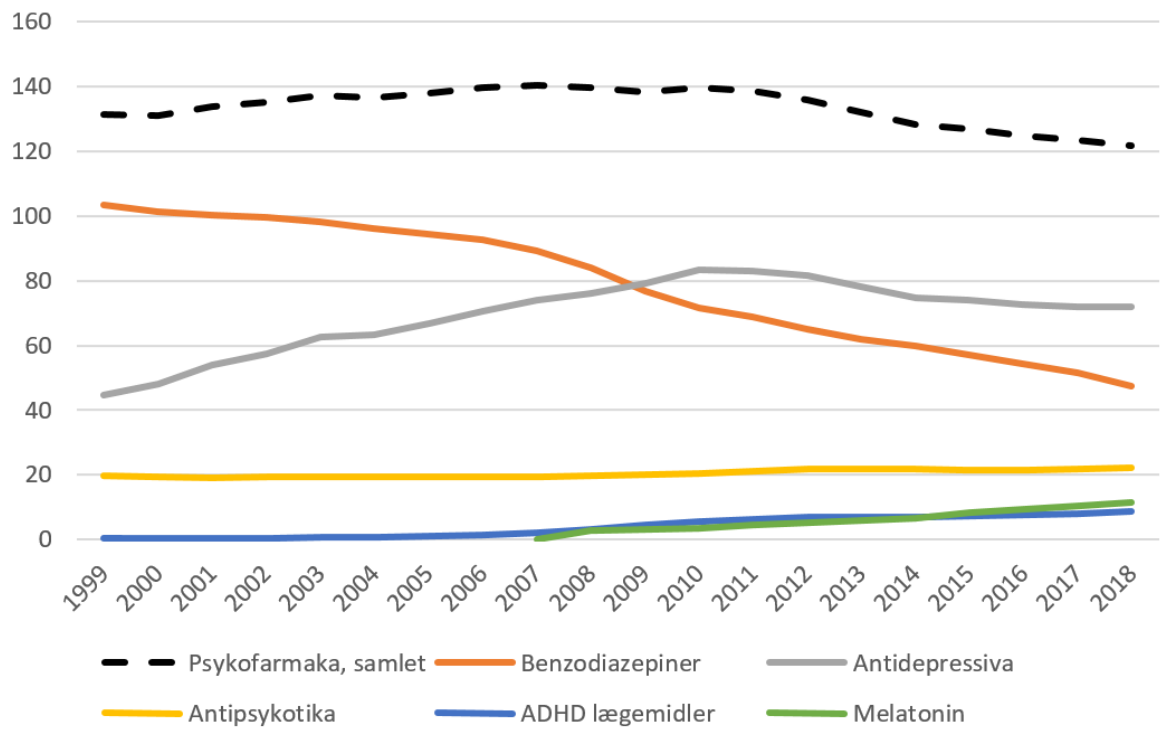

Figure 2. Use of psycho-pharmaceutic medication in Denmark.

Dashed line: psycho-pharmaceutic drugs combined
Orange line: benzodiazepines
Grey line: antidepressants
Yellow line: antipsychotics
Blue line: ADHD-drugs
Green line: melatonin
https://sundhedsdatastyrelsen.dk/da/nyheder/2019/medstat_psykofarmaka_101219

If we took away all this medicine, then how would we score on the happiness barometer and what would the "stress numbers" **ACTUALLY** look like? Whether the actual numbers might be higher or not, the above-mentioned number of people who are sick with stress are already reason enough to be worried.
This increase in stress manifests in the number of clients who seek help in psychotherapeutic and psychiatric clinics due to stress sickness. However, it is not only the individual who "pays" a high price when getting sick with stress. The organizations and the society do as well have micro and macro-economic cost. According to Hassard et al. (2018), who conducted a systematic review of the available evidence, examined the cost of work-related

stress (WRS). They included 15 studies which fulfilled 10 COI (cost-of-illness) quality assessment criteria. Hassard et al. (2018) write that the studies "originated from Australia, Canada, Denmark, France, Sweden, Switzerland, the United Kingdom, and the EU-15". The total estimated cost of WRS was observed to be considerable and ranged substantially from US$221.13 million to $187 billion. The observed cost refers to the above-mentioned countries. However, Hassard et al. (2018) are not precise in this respect. It remains unclear, why Denmark, France, Sweden, and the United Kingdom were named explicitly, as they belong to the EU-15. Stress costs a lot, but what is stress actually? In the following chapter, stress will be further explored.

Definition of stress

In order to establish a broad understanding of stress, a two-parted approach was implemented. Firstly, like usually done, a literature research on stress resulted in an overview of definitions and conceptualizations of stress. Secondly, interviews were conducted to get updated practical knowledge about stress from experts who have many years of experience in the stress field in Denmark. These experts were

Expert 1: Male, psychiatrist, 30 years of experience.
Expert 2: Female, medical doctor, 20 years of experience.
Expert 3: University professor, female, 30 years of experience.

What we know about stress today is that it causes a natural adaptive response to challenges due to physiological pathways which emerged in evolution. The General Adaptation Syndrome (Selye, 1936, 1950) involves the hypothalamic-pituitary-adrenal-cortical pathway and the stress hormone cortisol. Cannon's (1914) fight or flight response is mediated by the sympathetic-adrenal-medullary system and releases adrenaline as well as noradrenaline. Both responses are harmless if of shorter duration and, more important, are reset by physical activity and relaxation. However, if the stress response is sustained for a long time without relaxing breaks (cortisol reducing) and does not involve adrenaline reduction by physical activity, respectively, then it is harmful, both physically and mentally (Expert 3, 2015).

In the following, a more detailed look into the medical terms of stress as a condition characterized by physiological reactions and symptoms initiated by stressors will be provided

(Cannon, 1914; Selye, 1936, 1950). The physiological reactions increase the tone in the sympathetic nervous system, change metabolism in a catabolic direction, and stimulate immunological reactions. The effect on health is dependent on the strength and duration of the stressors, how the situation is perceived, the available resources of the individual, and to what extend coping succeeds (Netterstrøm, 2012). Another simple but very telling definition: stress is when people get so many symptoms, that their daily lives do not work for them (Expert 1, 2015).

According to (Expert 2, 2015) there is a lot of confusion about how we define stress, not because there is much disagreement, but more so because people use stress about everything. Stress is complex (Amirkhan et al., 2018) and is called many different names. ISO (International Standard Organization), for example, defines in ISO norm 10075 the following technical terms to explain different forms of stress. First of all, ISO 10075 defines stress as neutral physical conditions to which people are exposed in the same physically definable intensity (stress is the translation of German Belastung; ISO 10075 is based on the Deutsche Industrie Norm DIN 33405 from the early 1980s and DIN 33430). Strain then is the very individual response to these physical conditions, which depends on the individual's state, e.g. sleep deprivation, and the personal assessments of the situation as well as the own coping capabilities. In German this is called Beanspruchung and it can be optimal, too weak (sleepiness, boredom), or of course too high. The English translation is strain, derived from the verb "straining". ISO 10075 then defines positive kinds of strain: physiological activation, warming up (e.g., of muscles), training/learning (higher motoric and of course cognitive functions). The negative forms of strain in ISO 10075 are psychological fatigue, satiation, monotony, and loss of vigilance. In colloquial language, however, mental strain, work stress, mental stress, external workload, fatigue-like states, mental fatigue, burnout, stress-related exhaustion, compassion fatigue, occupational stress, life stress, perceived stress, stress, overload, burnout syndrome, stress-related exhaustion, dependent stress, emotional stress, work-related stress and many more terms all have different meanings, and yet they are all close to the term "stress". It is very easy to get lost in trying to agree or to find out one simple explanation of what stress is.

In 1966 Lazarus defined stress as "*a relationship between the person and the environment that is appraised as personally significant and as taxing or exceeding resources for coping*." (Lazarus, 1966)

Robbins and Judge (2012, 243) state "*Stress is a dynamic condition in which an individual is confronted with an opportunity, demand, or resource related to what the individual desires and for which the outcome is perceived to be both uncertain and important*."

The above two definitions are defining stress from inside the individual e.g., how the individual perceives external situations and internal resources to cope. The following definition is interesting, because it not only defines stress from what is going on in the individual with respect to challenges and resources, but also from the threats and supports existing outside the organism.
"This new orientation is related to a recent metaphysics of mind, according to which mental states and processes are embedded in and possibly even extend into the environment. It holds that the mind needs to be understood not just by intrinsic mental features such as physiological or cognitive processes, but also in light of what either occurs or exists outside the organism". (Kierkegaard et al., 2015).

How is stress "diagnosed" in Denmark?

There is no Danish official stress measure or official guidelines from the Danish Psychologist Association or the Government on how to "diagnose" stress. The World Health Organization (WHO) considers in the International Classification of Diseases ICD-10 version 2016, in section F43 several diagnoses for different stress related disorders (WHO, 2016 https://icd.who.int/browse10/2016/en#/F40-F48). In May 2011 the WHO started working on the ICD–11, it shall be taken into effect January 2022 (see https://www.who.int/classifications/icd/revision/timeline/en/).
When searching the term stress on ICD – 11, seven diagnoses are attained (Table 1). This shows, how broadly the term stress is used, how confusing it can be, and that it is used in many contexts. And maybe therefore it creates problems for everybody to diagnose, understand, and take it seriously.

Table 1. ICD – 11 shows the following 7 diagnoses of stress disorders.

6B4Z:	*Disorders* specifically associated with *stress*, unspecified
QE84:	Acute stress reaction, acute *stress disorder*
6B40:	Post traumatic *stress disorder*
6B41:	Complex post traumatic *stress disorder*
B4Y:	Other specified *disorders* specifically associated with *stress*
FB80.Y:	Other specified disorders of bone density and structure, *Stress*-induced *disorders* of bone density or structure
6E40.4:	*Stress*-related physiological response affecting *disorders* or diseases classified elsewhere

Source: https://icd.who.int/ct11/icd11_mms/en/release

WHO ICD–11 has a diagnose that is specifically work related: QD83.1**:** "Problem associated with stressful work schedule", see https://icd.who.int/ct11/icd11_mms/en/release.
There are other tools than ICD–11 to define and measure stress e.g., the Danish version of the 10-item Perceived Stress Scale (PSS-10, Eskildsen et al., 2015), a new scale to measure emotional stress vulnerability[1] (Craparo et al., 2018), the Stress Overload Scale (SOS) and extensive checklists of potential markers, i.e., symptoms and behaviours (Amirkhan et al., 2018). The Danish psychological publisher[2] has a "Stress indicator" test - a clinical and a business version, see https://www.hogrefe.dk/shop/catalogsearch/result/?q=stress&search-submit
It surprises, why the ICD–10, or any of the other tools, are not adopted by the Danish Government and / or the Danish health system as official tools to diagnose stress. Also, ISO 10075 offers tools like, for example, the Copenhagen Psychosocial Questionnaire (COPSOQ, Kristensen et al. 2005). Neither of these are official instruments of Danish authorities.
People in Denmark, however, do get increasingly sick with stress, so how do "we" – the individual, the doctor, the psychologist, the company, the society, find out that it is stress causing or at least contributing to the sickness and what to do about it?

[1] https://dictionary.cambridge.org/dictionary/english/vulnerability
[2] https://www.hogrefe.dk/shop/catalogsearch/result/?q=stress&search-submit=

Stress symptoms

When we talk about the way people react, we call it a stress response. And that response can be physiological e.g., stress hormones are released. However, they evolved for fight or flight, and today are maladaptive, when we face mental and social challenges. Stress responses can be behavioural e.g., drinking more alcohol and more coffee, becoming aggressive, and they can be mental. These responses are natural and gave humans evolutionary advantages. However, we need time for restitution and rest. "What happens in the longer term, it seems, is that one's physiological stress response may no longer be able to be activated in the way we usually activate it. We do not get the healthy reaction." (Expert 2, 2015).

Typically, a person feeling sick consults the doctor, because the psychological and / or the physical changes impair daily life and well-being. De Vente et al. (2015) mention this as distress and burnout complaints. Behaviourally, people sick with stress either get depressed or irritable, they forget things, they perform worse at work, they change behaviour (Expert 1, 2015). Negative emotions are directly induced by the degree of stress (Asgari, 2016) in people with insufficient coping resources. Whereas people with positive expectancy, i.e., sufficient coping resources, initiate mechanisms of anticipatory stress regulation that enhance the regulation of the physiological stress response. "Expectancy and anticipatory stress regulation may be key mechanisms in the development and treatment of stress-related disorders" (Pulopulos et al., 2020).

There is little empirical evidence to verify, which actually are signs of pathogenic stress overload though a number of symptoms and behaviours are indicative (Amirkhan et al., 2018). Though there are studies that try to find out and define some stress symptoms. According to Eskildsen et al. (2017), some of the stress symptoms, people with work-related stress have, are cognitive impairments (e.g., memory and concentration losses). Also, according to Expert 1 (2015), the cognitive functions that we see impaired due to stress are memory and concentration. Exhaustion caused by long-term work-related stress may cause cognitive dysfunction. Sandström et al. (2011) explored factors that may link chronic stress and cognitive impairment. Sleep disturbance is a stress reaction according to Grossi et al. (2015). Insomnia-type sleep disturbances are frequent among patients suffering from stress-related exhaustion disorders (Sheehan, 2019). The consequences of too little sleep are that people remember worse, get hurt somewhere due to lapses or slips, get depressed (Expert 1, 2015) and many other health issues like, for example, hypomanic episodes. Recent increases

in reports of disturbed sleep are very concerning as links with a number of adverse health outcomes in the population were discovered (Sheehan, 2019).

Although stress is a common experience in everyday life and originally was adaptive, a clear understanding of how often an individual experiences and reports stress is lacking (Zawadzki et al., 2019). For this reason, it is so difficult to measure stress. There is little information regarding which aspect of stress is measured. Temporal and permanent conditions of stress assessments become blurred e.g. time of day, day of study, weekday, weekend (Zawadzki et al., 2019).

According to Expert 1 (2015) people's own experience of their functional level is a very good way to measure the level of stress. They are asked on a scale of 1 - 10, how they would rate their work ability (Expert 1, 2015). This general assessment of functioning usually correlates with the duration and intensity of the stress people have been exposed to. If stress is an emotional burden, then it is usually much more difficult to cope with compared to a cognitive overload. Apart from the general assessment of functioning, Expert 1 (2015) recommends inquiries of:

1. How long the load has been on. People, who have been charged for 14 days usually have less difficulties returning to normal relative to those who were exposed longer.
2. The nature of the load, qualitatively. Is it an emotional load? Is it a cognitive load, a quantitative (working very much) load?
3. The function level and the amount of stress symptoms.

Trying to answer, how we identify and treat stress in Denmark, we could proceed as follows:

1. The individual seeks help from the general practitioner or the occupational health service, because they suffer psychologically and / or physically – the doctors identify stress and send the individual to a psychologist.
2. The psychologist identifies the kind and level of stress.
3. The therapy has a focus on treating and repairing schemas as well as preventing the individual from getting sick again with stress.

The biological consequences of stress

“Although stress is usually associated with disease, the physiological and behavioural responses to stressors are critical mechanisms of resilience for healthy organisms.” (Romero et al., 2015). However, with too much stress the body becomes an unhealthy organism and

things changes in our body. The hippocampus gets smaller with anxiety and depression. This also happens under stress. The amygdala gets bigger in depression, it also happens under stress (Expert 3, 2015). Evans et al. 2016 found in their study that increased life stress during childhood leads to larger amygdala volumes in children and adults which emphasize the association of amygdala volume and stress reactivity. Moreover, Kogler et al. (2015) found a positive correlation between amygdala volume and baseline cortisol levels, which underlines the excitatory effect of the amygdala on the hypothalamic-pituitary-adrenocortical (HPA) axis leading to increased corticoid secretion. A growing body of literature demonstrates that feedback between the peripheral immune system and the brain contributes to individual differences in the behavioural response to stress. In the study of Tsyglakova et al. (2019) a variety of cellular, cytokine, and molecular mechanisms in adult animals were identified that act in concert to produce a stress susceptible individual response. Furthermore, stress and increased hormone levels, especially adrenaline and cortisol, were connected: These findings suggest that cognitive dysfunction in stress-related exhaustion is linked to distinct personality traits, low quality of life, and increased ACTH (adrenocorticotropic hormone) and also CRH (corticotropin-releasing hormone; Sandström et al., 2011).

Stress, the brain and the hormone system

Parasympathetic and sympathetic activation are antagonistic. Sympathetic measures of strain are increases of adrenaline, blood pressure, and heart rate. The sympathetic nervous system is our response to acute stressors. It is the one that responds immediately. 10 - 15 minutes later, due to the slower ATCH transport through blood vessels, the cortisol system follows. Cortisol is our opportunity to look into the hypothalamic-pituitary-adrenocortical axis (HPA; Expert 2, 2015). HPA is activated when the individual experiences a loss of control and the stress hormone cortisol is released from the cortex of the adrenal gland into the blood circuit. With a sustained HPA activation, cortisol storages are exploited and instead of cortisol peaks in the morning and afternoon, we have a flat curve during the day (Expert 3, 2015). Cortisol is very basic for the body's functions. The cortisol level rises 50% when we wake up in the morning, and then decreases during the day, to the lowest before going to sleep. High cortisol levels make us sleep badly, because it suppresses melatonin, the sleep hormone. However, we need cortisol, because glucose and fat are released to the blood, so that we have enough energy to meet the challenges, especially physical ones, we have in everyday life. Too many challenges, especially of mental and emotional character, make us drive in a very high gear

all the time, without using up the fuel. At some point, the system is exhausted. All neurotransmitter systems, among them the hormones, are connected. Experiencing a load in one system causes other systems to take over (Expert 2, 2015). O'Connor et al. (2020) found that dysregulated cortisol and stress later in life are connected: "*Evidence has indicated that childhood trauma is associated with dysregulated cortisol reactivity to stress in adulthood*" (ibidem).

Stress has a huge impact on many things, it can even change the personality traits: "Stress alters neural dynamics and precipitates disorders that shape personality traits involving negative affectivity". (Shields et al., 2016). Accordingly, stress directly influences different organs and systems in the body. Stress also impairs our eating behaviour: "As high stress has become ubiquitous in modern society, so too has the prevalence of overweight and obesity, leading many to question whether these changes are related. Does stress affect eating? Our review indicates that regardless of how stress and eating are operationalized, manipulated, or analysed, and regardless of sample characteristics, associations of stress with eating behaviour are observed quite consistently, with some variability due to individual differences". (Araiza et al., 2018). This too is a cost and a health burden, both for the individual and for the society.

Anxiety and depression as common consequences of stress

Stress is seen as a risk factor for depression and anxiety (e.g., Mazure, C. M.,1998). Xi et al. (2016) share this view: "Stressful life events might significantly affect the severity of depressive symptoms". Stressful life events in this view are stressors that cause strain, depression, and anxiety. Another view is that the vulnerability to depression is already there, before the stressors occur. However, the stressors will cause strain, depression, and anxiety: "The stress-generation model, commonly applied in studies of psychopathology, supports that vulnerabilities to depression (e.g., rumination, doubt, self-blame, social withdrawal) increase the likelihood that stressful events will later occur, thus activating depressive vulnerabilities and worsening the course of depression". (Hammett et al., 2020). Kushner et al. (2017) state "Youth with depression are theorized to generate stress in their lives because of a complex interaction between their personal characteristics and their chronic environmental context". Similar, in this dissertation, schemas experienced and acquired during childhood and adolescence according to Young are considered previous impacts triggering illness in adult life.

According to Expert 3 (2015), stress vulnerability can be programmed already in a foetus: “If a foetus mother has been stressed, abused, something like that. When the foetus becomes a young person, there is a greater risk of, for example, depression and anxiety disorders. So, there has probably been something that has made a mark on that child. It is called ’Foetal programming’”. This programming is mediated by the HPA axis. Thus, differences in children, whose mothers and themselves have always been good in coping with stress compared to those with poor capabilities can be explained. The vulnerabilities that are already innate will be aggravated by stress. Vulnerability can occur in many manifestations. It can be a mental vulnerability that one is more delicate when talking about suicide because one's father committed suicide. There may be a permanent sympathetic adrenomedullary system (SAM) activation making the heartbeat fast (Cannon, 1914). After all, vulnerability can be a very broad concept. It will be used in this dissertation in general terms to express that under stress, the vulnerabilities will appear or will worsen.

Many views agree that the stressors activate depression. The difference is whether the individual is pre-programmed e.g., due to early trauma or early exposition to risk factors like, for example, substance abuse. The “seed” of stress, i.e., vulnerability to stress, depression, anxiety, and / or hypomanic behaviour is already set. Pre-programming makes a difference for intervention. If the vulnerability is already there, for example, due to unhealthy schemas, an early detection is necessary. The intervention and prevention programmes need to include repairing traumas, preventing recidivism, helping to understand and accept one’s own vulnerability. Becoming an expert of one’s own disease is important; psychoeducation on schemas, physiology, nervous systems, hormone systems help realizing, why it is especially important to remember to take breaks. Learning how to early recognize the early warning systems like, for example, impaired sleep, and taking care of oneself e.g., by relaxing breaks, putting not too much in the calendar or on the to-do-list, making sure to draw positive energy from mindfulness perception, and meditating (see below). If the vulnerability is NOT pre-programmed, the focus is more on helping in daily life e.g., by looking at coping styles and preventing to get sick again.

Who gets sick with stress?

Very often, well-functioning members of society fall prey to stress. Many are best performers and therefore cannot imagine losing control over work and family live. “And many of these people, they have the feeling that it is the others who are stressed, and such a thing does not

affect me". (Expert 1, 2015). Women are much better at responding to their symptoms than men are, and they will do something about it. On the other hand, their susceptibility to stress is higher. The men "they pout" themselves (Expert 1, 2015). Men more than women consider sickness due to stress a weakness[3]. In certain occupational groups, for example, air traffic controllers, pilots, policemen, firefighters, a lonely cowboy mentality belongs to their occupational identity and it needs a shift from this lonely rider or cowboy mentality to a team-based culture (Leonhardt & Vogt, 2006). Although women cope better, they also have many more "balls in the air" in everyday life than men have. They usually lead the households, care for the young and the old, while men often prioritize these activities down. And then the women have a different job market. After all, as nurse, flight attendant, waitress, or social worker, female dominated job roles, they have much more emotional strain than men. So, there is a huge difference between genders (Expert 1, 2015).

Are certain working groups more susceptible to stress sickness?

According to García-Carmona et al. (2019) "Secondary school teachers are one of the occupational groups presenting the highest levels of sick leave due to stress in the workplace. This form of stress can cause the burnout syndrome, which is characterized by emotional exhaustion, depersonalization, and low levels of personal accomplishment".
Also, the above-mentioned occupational groups were shown to be especially prone to stress illness due to unusually high mental, physical and / or emotional strain: air traffic controllers (Leonhardt & Vogt, 2006), pilots (Roscoe, 1978), policemen (Schuster, 2019), firefighters (Kim et al. 2018), flight attendants (Nolle, 2005), nurses (Ghasemian, 2017) and / or social workers (Cornille & Meyers, 1999).
Is there an overlap between Burnout (stress) and depression? Bianchi et al. (2015) answer as follows: "Whether burnout is a form of depression or a distinct phenomenon is an object of controversy. The current state of the art suggests that the distinction between burnout and depression is conceptually fragile".

Is stress an individual-, not an organizational or society problem?

The organizations and the society were until very recently not made part of the solution on how to stop the increase in the amount of people getting sick with stress. The individuals had

[3] https://dictionary.cambridge.org/dictionary/english/weakness

to solve it themselves (with help from doctors and psychologists). The society, however, puts money in stress interventions, but instead of preventing, the focus is on "repairing" people that are sick with stress. Expert 1 has worked quite a lot with organizations in Denmark and has some solutions that the organizations could use to prevent their employees from becoming sick with stress. Vogt et al. (2010) recommend integrating stress and health management into the line organization of companies by using management tools like, for example, the balanced scorecard. However, to cite Hobfoll (1998): "Because we have ignored studying the sociocultural level of the stress experience, we have been able to deny its potentially central role."

Stress, the society and the organization

*The **increase in the amount of people that get sick with stress** in Denmark causes enormous cost for the Society and the organizations:* "stress has a cost… as well as for organization in terms of absenteeism and turnover" (Ghasemian et al., 2017). *Therefore, it is of urgent importance to try to find out what makes people strain excessively in organizations.* Edgar Schein (1992; Figure 4) distinguished visible from non-visible factors. Visible are organizational structures and processes; he called them artefacts. Not visible, but most relevant for our behaviour, are the society's basic underlying assumptions, for example, implicit cultural expectations. *By identifying these factors, we can start to make changes in the areas that make people sick with stress.*

Apart from Schein's Levels of Culture Model, the conceptual model of organizations as developed by Hatch and Cunliffe (2013, 16; Figure 3) is relevant for this thesis. Both models are on the meso-level of companies, governmental and non-governmental bodies. However, also the society can be seen as one big organization and therefore, the two models are combined in this chapter. They complement each other very well when looking at what factors / areas in the society / the organization influence the individuals' lives and therefore contribute to the individual becoming sick with stress. The conceptual model of organization (Hatch & Cunliffe, 2013, 16) can be seen as a horizontal model, it identifies main factors / areas that the individual is exposed to in the society. The levels of culture (Schein, 1992, 17), on the other hand, can be seen as a vertical model. It illustrates the depth and the complexity. It conceives some factors as invisible (basic underlying assumptions) and even if all are visible (artefacts) it can be hard, nearly impossible to understand their interaction.

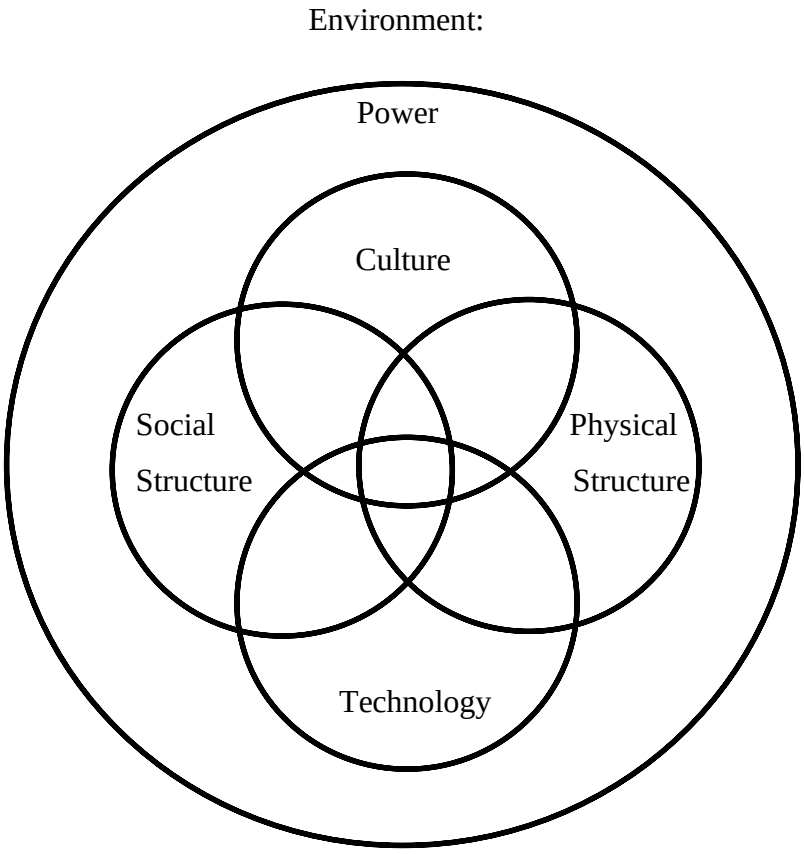

Figure 3. A conceptual model of organization (Hatch & Cunliffe, 2013, 16).

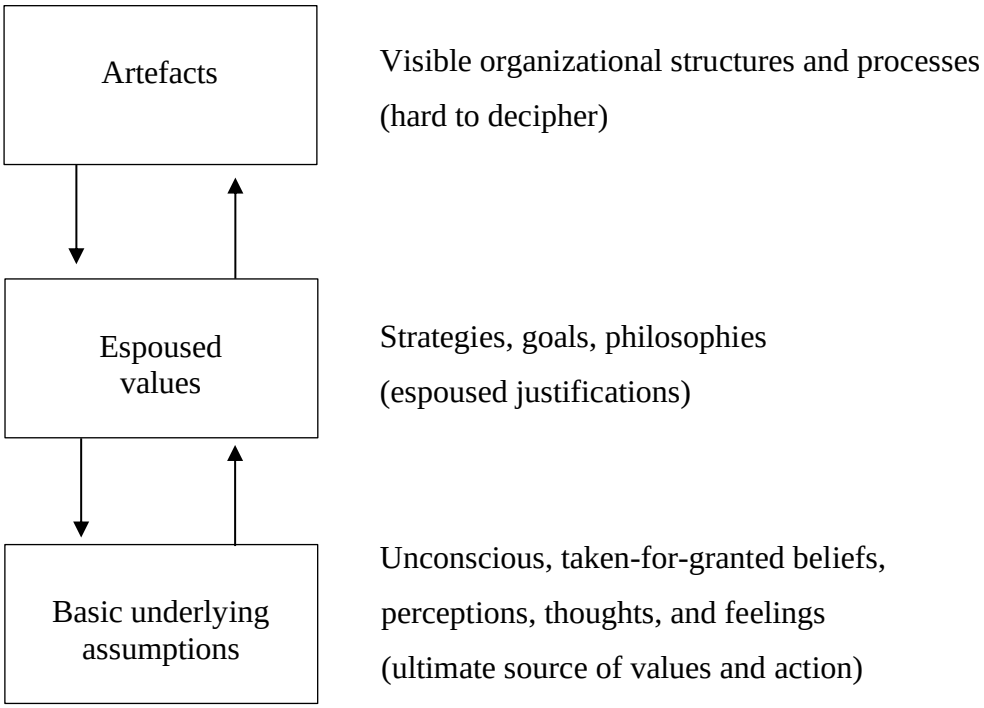

Figure 4. Levels of culture (Schein, 1992, 17).

Schein refers to the visible factors as artefacts. They are at the surface and include all phenomena that can be seen, heard, and / or felt. Integrating a new group of employees, for example, with an unfamiliar culture, the visible products of the group are the architecture of the physical environment, language, technology, and products, artistic creations, and style as embodied in clothing, myths, and stories told about the organization, as well as published lists of values, observable rituals, and ceremonies (Schein, 1992, 17).
Espoused values are strategies, goals, and philosophies, as these justify any attitude and / or action. Basic underlying assumptions provide cognitive stability as a basic human need, therefore, any challenge for the questioning of basic assumptions will release anxiety and defensiveness (Schein, 1992, 23). Rules, regulations, norms, infrastructure, and laws are – so to speak – the society`s – justifications and they certainly impact the individual's life, possibilities, and limitations.
In the conceptual model of organization, physical structure refers to the infrastructure, for example, whether or not it is convenient to travel from home to work. Also work family conflicts are considered here, for example, availability of childcare, which can – as we have seen in the Corona lock-down of childcare institutions – expose to persisting and intense stress.
Schein describes several stress factors at work, among them incompetent leadership, remote leadership, unclear descriptions of job roles and work tasks, unhealthy working environments in physical, e.g., noise, and social terms, e.g., bullying, the introduction of new IT systems, home office problems like unergonomic, fretful, and/or distractive environments.

Stress and the individual

According to Hobfoll (1998), stress can be seen metaphorically as an iceberg (Figure 5), we only see the tip above the surface, when we ask people for their appraisal of stressful circumstances.

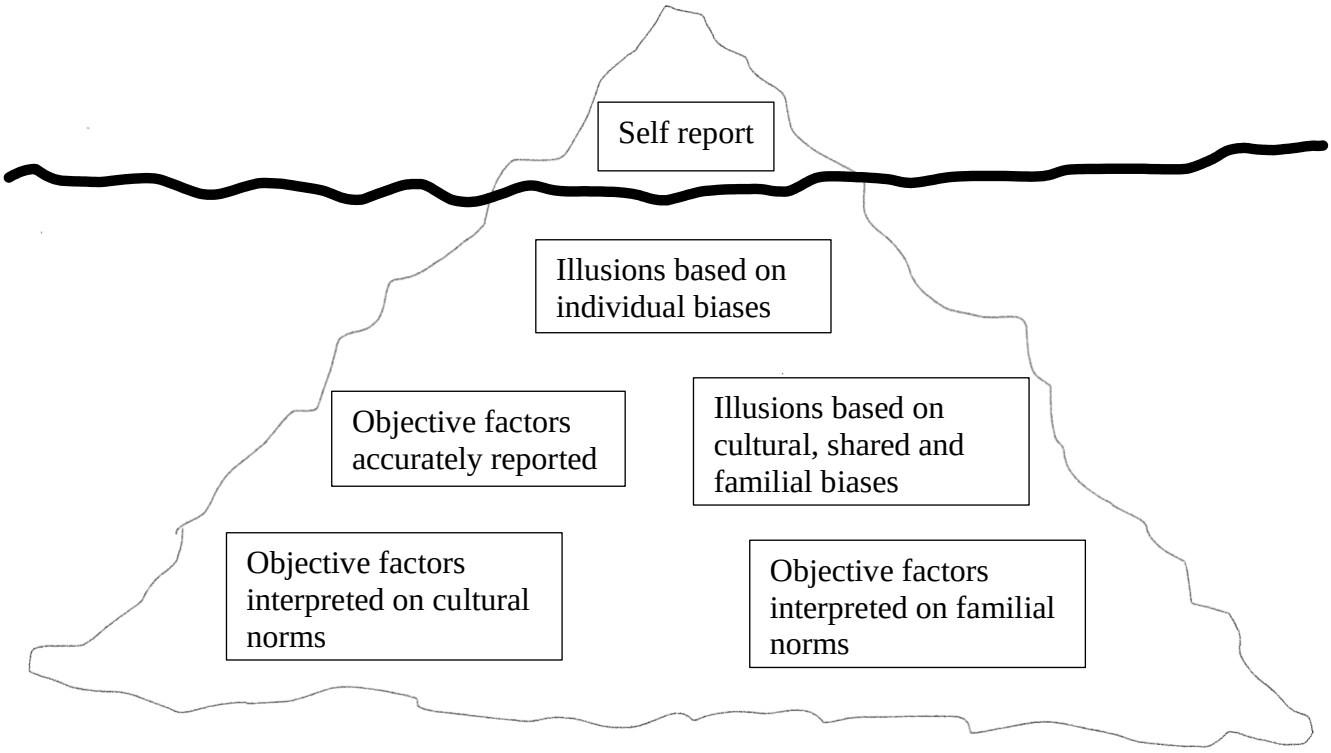

Figure 5. Own created draft of Hobfall's iceberg model (Hobfoll, 1998).

Self-report in Hobfall's iceberg model is the tip of the iceberg and the only source of information about the individual apart from medical measurement data. And even the latter are not very conclusive without self-report. Illusions based on individual biases are, for example, the over-generalized self-doubts of people with depression ("I am bad in everything") as well as the excessive overconfidence of maniacs.

Objective factors, which can be measured in physical terms, are e.g., residential noise or mould at home or at work. Noise causes significant increases of depression (Seidler at al., 2017).

Illusions based on cultural, shared, and familial biases are, for example, that Japanese, by dint of their cultural upbringing, are vigilant about their shortcomings with respect to consensually shared standards and work toward correcting these deficiencies (Endo et al., 1999). With respect to objective factors interpreted on cultural norms, Heinrichs et al. (2006) underline the importance of perceived social norms and social anxiety. Finally, it is known since many years that objective factors are interpreted on the basis of social norms. Smith and North (1988), for example, systematically interviewed depressed women in an 11-year follow-up study. They found a gradation in severity of illness with classified familial subtypes during hospitalization.

As mentioned earlier, it is complex to find out exactly, what the stress symptoms and their underlying causes are. Even more difficult is their measurement and treatment. Though there probably is some agreement that stress is not caused by one factor but rather is multi-facetted and multi-causal process with psychological, social, biological interactions as well as internal (e.g., schemas) and external (e.g., work, corona lockdowns) contributing factors.
In 1967 the psychiatrists Thomas Holmes and Richard Rahe examined over 5,000 patients' medical records to determine, whether stressful events cause illnesses. They ranked a list of 43 life events based on a relative score, i.e., normed at a significant life event most people experience, the marriage (Noone, 2017). 50 years later they state about the social re-adjustment rating scale "the SRRS is surprisingly consistent despite the cross-cultural differences one would expect". (Noone, 2017). The SRRS looks as following (Table 2).

Table 2. Examples of critical life events modified according to Holmes et al. (1967); basis of the social re-adjustment rating scale.

Rank	Life Event	Mean
1	Partner's Death	100
2	Divorce	73
…	…	…
10	Retirement	45
…	…	…
20	Taking out a large loan	31
…	…	…
30	Difficulties at work (with the boss)	23
…	…	…
43	Minor criminal acts	11

Cohen (2019) concludes that "After over 70 years of research on the association between stressful life events and health, it is generally accepted that we have a good understanding of the role of stressors in disease risk."

If it comes to intervention and prevention of stress-related disease, working hours are one of the easy parameters to change. According to Holmes (1967) "change in work hours or conditions" is number 31 on the list and "gives a score on 20 where 100 is the most". This is in accordance with Expert 1 (2015), who states: "You can much better handle changing your life in terms of how much you work than if it is because you have been hurt and you have an emotional strain e.g., if you have been bullied or if there is some emotional conflict e.g., in the family, with the wife, with the man or with the children".

Can mindfulness and meditation help coping with stress?

During the past two decades, mindfulness meditation has gone from being a fringe topic of scientific investigation to be an occasional replacement for psychotherapy, a tool of corporate well-being, widely implemented educational practice, and 'key to building more resilient soldiers.'". (Van Dam et al., 2017). It was Jon Kabat – Zinn who founded the mindfulness-based stress reduction (MBSR) programme: "There has been an explosion of interest in Mindfulness-Based Programs (MBPs) such as Mindfulness-Based Stress Reduction (MBSR). MBSR has accrued a robust evidence base in improving mental health outcomes in those with chronic physical health problems". (Bohlmeijera, Prenger, Taal & Cuijpers, 2010). Mindfulness-based cognitive therapy (MBCT) is an adaptation developed to teach those at high risk of depressive relapse skills to stay well and has been shown to be effective (Kuyken

et al., 2016). Mindfulness-based programmes in the context of MBSR were developed as an education and training vehicle for people with chronic health problems and those suffering from the mounting demands associated with psychological and emotional stress, to learn to relate in new ways to life challenges (Kabat-Zinn, J. et al., 2009).
But why is mindfulness helpful? The autonomous system controls hormones, blood pressure, heartbeat, bowel function etc. A stressed or frightened individual activates the sympathetic system. Cultivating mindfulness, sitting, relaxing, positively focusing on one certain aspect of the environment or one's own perception of it, activates the parasympathetic system counteracting the sympathetic antagonist. Practicing the balance of the two autonomic nervous system players will help reducing arousal and facilitate relaxation. When people cannot find "the inner peace", then there is too much going on in the sympathetic nervous system. To keep it under control, one must learn to sit down and relax (Expert 3, 2015). According to Savel et al. (2017), 5 minutes each day to quiet the mind help us to live healthier and happier. Clinicians should be aware that meditation programmes can result in small to moderate reductions of multiple negative dimensions of psychological stress. It is not only used by psychologists in private practices, it has to be moved into organizations: "In recent years, both mindfulness and character strengths have started to garner interest in industrial and organizational psychology… Given the interconnection of mindfulness and character strengths, the present study examined the effectiveness of training that combined the two practices regarding well-being and work-related outcomes… Results showed the MBSR was effective for increasing well-being, reducing perceived stress, and increasing job satisfaction." (Pang & Ruch, 2018). Results from another study (Żołnierczyk-Zreda et al., 2016) suggest that MBSR is an effective method for managing work-related stress and bolstering psychological resilience in the workplace.

Stress and personality traits

lsheshtawy et al. (2018) used the "Big Five" traits to look at stress and they found that individuals high in neuroticism are more prone to have high levels of perceived stress and subsequent development of depression and anxiety. Likewise, the subjects in the treatment group of this dissertation many people have a focus on their weak sides and vulnerabilities. However, there are more positive and proactive ways to look at how to deal with stress. Harzer and Ruch (2015a), for example, investigated the strengths that are already in the individual: "Personality traits have often been highlighted to relate to how people cope with

stressful events. The present paper focuses on character strengths as positive personality traits … Character strengths are trainable personal characteristics, and therefore valuable resources to improve coping with work-related stress and to decrease the negative effects of stress". (Harzer & Ruch, 2015a). Character strengths, per definition, contribute to individuals' fulfilment, flourishing, and thriving (Harzer, 2020). Results from another study (Harzer & Ruch, 2015b) supported the assumption that the application of strengths at work also impacts calling and life satisfaction. Besides, there are examples showing that character strength can be used as stress defence: character strengths are stress-defence factors that allow for psychological and physiological adaptation to stress **(**Li et al., 2017) and to decrease depression. Across seven studies, interventions had a significant impact on decreases in depression (Schutte Malouff, 2019).

Stress and schemas

Previous studies on stress and schema therapy

Table 3 shows the results from the literature search and gives an overview of the used keywords "Stress" AND "Schema Therap*" in the following 7 databases:

1. PsycINFO 1887 – today
2. Web of Science from ISI, Annual Reviews 1932 – today
3. International Encyclopedia of the Social & Behavioural Sciences, 2. Ed. 2015
4. Philosophers Index 1940 – today
5. SCOPUS
6. PubMed (MEDLINE) 1966 – today
7. Stanford Encyclopedia of Philosophy

Table 3. Results from the literature search with the keywords "Stress" AND "Schema Therap".*

Database	Search Keyword used	Total result	Selec-ted	Title	Authors	Source	Relevance for this Dissertation
PsycINFO 1887 -	Stress AND" Schema Therap*"	43	1 of 43	"Teaching me to parent myself': The feasibility of an in-patient group schema therapy programme for complex trauma."	Younan, Rita; Prahran, Farrell; Joan; May, Tamara.	Behavioural and Cognitive Psychotherapy, Vol 46(4), Jul 2018. pp. 463-478.	No
			2 of 43	Translated Title: "Reattach a new schema therapy for adults and children? Part I: Adults."	Weerkamp-Bartholomeus, Paula J. P. W.	Psichiatria e Psicoterapia, Vol 34(3), Sep 2015. pp. 181-191.	No
			3 of 43	"A schema-focused approach to treating work dysfunctions."	Bamber, Martin.	CBT for occupational stress in health professionals: Introducing a schema-focused approach. Bamber, Martin R., (Ed); pp. 177-190; New York, NY, US: Routledge/Taylor & Francis Group; 2006. xiv, 262 pp.	No
			4 of 43	"A new look at the schema therapy model: Organization and role of early maladaptive schemas."	Bach, Bo; Lockwood, George; Young, Jeffrey E.	Cognitive Behaviour Therapy, Vol 47(4), Jul 2018. pp. 328-349.	No

Table 2 continued.

Web of Science from ISI	Stress AND" Schema Therap*"	27	1 of 27	"The Effectiveness of Schema Therapy Integrated with Rehabilitation on Cognitive Emotion Regulation and Existential Anxiety in Patients with Congestive Heart Failure"	Karbasdehi, ER; Abolghasemi , A.; Karbasdehi, FR	Journal of Contemporary psychotherapy	No
			2 of 27	"Early life experiences in OCD and other disorders: A retrospective observational study using imagery with re-scripting"	Basile, B.; De Sanctis, B.; Fadda, S.; Luppino, O.I.; Perdighe, C.; Saliani, A.M.; et al.	Clinical neuropsychiatry	No
			3 of 27	"Are Schemas passed on? A study on the association between early maladaptive schemas in parents and their Offspring and the putative translating mechanisms"	Sundag, J.; Zens, C.; Ascone, L.; Thome, S.; Lincoln, T.M.	Behavioural and cognitive Psychotherapy	No
			4 of 27	"Effectiveness of outpatient treatment programs for borderline personality disorder: a comparison of Schema therapy and dialectical behaviour therapy: study protocol for a randomized trial"	Fassbinder, E.; Assmann, N.; Schaich, A.; Heinecke, K.; Wagner, T.; et al.	Mmc Psychiatry	

Table 2 continued.

Annual Reviews 1932 -	Stress AND" Schema Therap*"	0		-	-	-	No
International Encyclopedia of the Social & Behavioural Sciences, 2. Ed. 2015	Stress AND" Schema Therap*"	4	1 of 4	"Symptômes dissociatifs et conduites à risques dans un cas de trouble de stress post-traumatique (TSPT) comorbide d'un trouble lié à l'usage de substances (TUS)." Translated: "Dissociative and risky symptoms in a case of post-traumatic stress disorder (PTSD) comorbid with a substance use disorder (TUS).	Tapia, G.; Marquebieille, C.; Delile, J.M.; Othily, E.; Perez-Dandieu, B.	European Journal of Trauma & Dissociation, 1(4), 217–226. (2017).	No
			2 of 4	"Étude des relations entre les schémas précoces inadaptés, les stratégies de coping et la flexibilité psychologique chez des sujets présentant des troubles anxieux." Translated: "Study of the relationships between inappropriate early schemas, coping strategies and psychological flexibility in subjects with anxiety disorders."	Billoux, S.; Chapelle, F.; Giocanti-Belmonte, C.; Callahan, S.	Journal de Thérapie Comportementale et Cognitive, 22(2), 46–52. (2012).	No

Table 2 continued.

			3 of 4	"The relationship between psychological flexibility, early maladaptive schemas, perceived parenting and psychopathology."	Fischer, T. D.; Smout, M. F.; Delfabbro, P. H.	Journal of Contextual Behavioural Science, 5(3), 169–177. (2016).	No
			4 0f 4	"Link between early maladaptive schemas and defense mechanisms."	Walburg, V.; Chiaramello, S.	Revue Européenne de Psychologie Appliquée/European Review of Applied Psychology, 65(5), 221–226. (2015).	No
Philosophers Index 1940 -	Stress AND" Schema Therap*"	0		-	-	-	No

Table 2 continued.

SCOPUS	Stress AND" Schema Therap*"	30	1 of 30	" The Effectiveness of Schema therapy integrated with rehabilitation on cognitive emotion regulation and existential anxiety in patients with congestive heart failure."	Rahbar Karbasdehi, E.; Abolghasemi, A.; Rahbar Karbasdehi, F.	(2018) Journal of Contemporary Psychotherapy, 48 (4), pp. 233-239.	No
			2 of 30	" Power of cognition: How dysfunctional cognitions and schemas influence eating behaviour in daily life among individuals with eating disorders."	Legenbauer, T.; Radix, A.K.; Augustat, N.; Schütt-Strömel, S.	(2018) Frontiers in Psychology, 9 (NOV), art. no. 2138.	No
			3 of 30	" Positive clinical psychology and Schema Therapy (ST): The development of the Young Positive Schema Questionnaire (YPSQ) to complement the Young Schema Questionnaire 3 Short Form (YSQ-S3)"	Louis, J.P.; Wood, A.M.; Lockwood, G.; Ho, M.R.; Ferguson, E.	(2018) Psychological Assessment, 30 (9), pp. 1199-1213. Cited 3 times.	No
			4 of 30	" Treating addiction with schema therapy and EMDR in women with co-occurring SUD and PTSD: A pilot study"	Tapia, G.; Perez-Dandieu, B.; Lenoir, H.; Othily, E.; Gray, M.; Delile, J.-M.	(2018) Journal of Substance Use, 23 (2), pp. 199-205. Cited 1 time.	No

Table 2 continued.

PubMed (MEDLINE) 1966 -	Stress AND" Schema Therap*"	8	1 of 8	"Elucidating DSM-5 and ICD-11 Diagnostic Features of Borderline Personality Disorder Using Schemas and Modes."	Bach, B.; Lobbestael J.;	Psychopathology. 2019 Jan 9:1-8. doi: 10.1159/000495845	No
			2 of 8	"Thinking about feeling: Using trait emotional intelligence in understanding the associations between early maladaptive schemas and coping styles."	Ke, T.; Barlas, J.;	Psychol. Psychother. 2018 Oct 28. doi: 10.1111/papt.12202	No
			3 of 8	"A first step toward integrating schema theory in geriatric psychiatry: a Delphi study."	Legra, MJH; Verhey, FRJ; van Alphen, SPJ.	Int Psychogeriatr. 2017 Jul;29(7):1069-1076. doi: 10.1017/S1041610217000412. Epub 2017 Apr 9.	No
			4 of 8	"Schema Therapy for Emotional Dysregulation: Theoretical Implication and Clinical Applications."	Dadomo, H.; Grecucci, A.; Giardini, I.; Ugolini, E.; Carmelita, A.; Panzeri, M.	Front Psychol. 2016 Dec 22; 7:1987. doi: 10.3389/fpsyg.2016.01987. eCollection 2016.	No
Stanford Encyclopedia of Philosophy	Stress AND" Schema Therap*"	0	-	-	-	-	No

In the literature found in the search, no article connecting stress and schema therapy was found. This makes the dissertation a unique piece of research.

Stress and schema interaction

The arrival of the "third wave" of CBT was declared 13 years ago. The claim was that a change was occurring in orienting assumptions within CBT, and that a set of new behavioural and cognitive approaches was emerging based on contextual concepts focusing more on the persons' relationship to thought and emotion than on their content. Third wave methods emphasize mindfulness, emotions, acceptance, relationships, values, goals, and meta-cognitions. New models and intervention approaches included acceptance and commitment therapy, dialectical behaviour therapy, mindfulness-based cognitive therapy, functional analytic psychotherapy, meta-cognitive therapy, and several others (Hayes et al., 2017).

> " Schemas have their root in actual childhood or adolescent experience, and to a large degree, accurately reflect the tone of a person´s early environment" (Rafaeli et al., 2011)

Schema therapy was originally used to treat people with personality disorders. However, together with other therapists, I got curious to find out, whether it also could be used as a "tool" to help people with other diagnoses. Many clients in our practices were sick with stress. It seemed that these people, though they were very different, shared some of the same unhealthy schemas. Schema Therapy is an integrative approach, bringing together elements from cognitive therapy (and CBT more generally), attachment and object relations theories, as well as Gestalt and experimental therapies (Rafaeli et al., 2011).

Young's theory, accordant therapy and questionnaire, were rarely subjected to scientific study. One of the few examples can be found in the European Journal of Psychological Assessment (Bach, Simonsen, Christoffersen & Kriston, 2015). This work proves the validity of the Danish translation of Young's questionnaire, which is used in this dissertation. For the purpose of this study, it was back-translated and compared to the original – a validity check with confirming results.

The third wave of behavioural psychotherapies is an important arena of modern psychotherapy. Kahl et al. (2012) conclude that the available evidence now allows considering all third wave treatments as empirically supported. It has added considerably to the spectrum of empirically supported treatments for mental disorders and influenced research

on psychotherapy. The presented methods open up treatment possibilities for patient groups such as borderline personality disorders and chronic depression or generalized anxiety disorders that had received only little specific attention in the past (Kahl et al., 2012).

Definition of Schemas

> „Schemas consist of sensory perceptions, experienced emotions and actions, and the meaning given to them, such that early childhood experiences are memorized non–verbally "(Young et al. 2005 in Van Vreeswijk et al., 2012)

Everybody has schemas (Van Vreeswijk et al., 2012). They manifest in healthy people as mature adult behaviour. People with personality disorders or stress sickness acquired schemas that were helpful in childhood (e.g., distance to mother causing anxiety and return) but are maladaptive in adult life (e.g., generalized anxiety). Most people have developed schemas that help them to better understand themselves, the behaviour of others, and events in the world. This makes them able to develop a positive self–image and a differentiated image of others, and to solve problems adequately. Some people have developed maladaptive schemas and therefore have problems (Genderen et al. 2012). According to Young et al. 2005 and Genderen et al. 2012, these maladaptive schemas are developed at an early age as a result of the interactions between factors such as the temperament of the child, the parenting style, and any significant (sometimes traumatic) experience. Although schemas are normally adaptive in early childhood and endorsed by the circumstances, it is assumed that they also interfere to a considerable extent with completing the developmental tasks well (Genderen et al., 2012). Maladaptive schemas are often maintained because the client avoids situations that could correct them, or because the client is looking for people who will confirm her / his schemas, and /or because the client has no eye for information that could nuance her / his schemas. The client learned to behave like this in childhood, in order to survive difficult or threatening situations. At that time, this may have been the best way to deal with these kinds of situations, but in the client's current life, this behaviour may be far from optimal (Genderen et al., 2012). Moreover, it maintains the schemas in self-reinforcing cycles. Schemas are more or less active or influential at any time. When circumstances show similarities with situations that have led to the development of the schema, then the schema will come to force (Genderen et al., 2012). "The more severe the schema, the more easily it becomes activated (triggered) and the more intense its consequences are". (Rafaeli et al., 2011).

Because schemas maintain and perpetuate themselves, they continue to prevent the same child needs from being met in adulthood. However, some schemas develop in adulthood. Schema Therapy recognizes the existence of needs that emerge in adulthood, for example, the need to work and the need to take care of others. Schemas that develop later in life are generally not as pervasive or as powerful as the ones appearing early on in the close family arena (Van Vreeswijk et al., 2012). Besides schemas, it is the assumption that everyone also has coping styles, modes, and needs that explains disorders (Van Vreeswijk et al., 2012). The difference between health and sickness is that needs, modes, schemas, and unhealthy coping styles are much more pronounced and less flexible in patients. In this dissertation, the primary focus is on schemas, but in the following, there will be a short description of coping styles, modes, and needs.

Coping styles

There are different ways to look at coping styles. Carver et al. (1989, 272) have developed a multidimensional coping inventory to assess the different ways in which people cope with stress. They have defined the following coping styles.

Measures of conceptually distinct aspects of problem-focused coping:

- Active coping
- Planning
- Suppression of competing activities
- Restraint coping
- Seeking social support – instrumental

Measures of what might be viewed as emotion-focused coping:

- Seeking social support – emotional
- Positive reinterpretation and growth
- Acceptance
- Denial
- Turning to religion

Measures of coping responses that arguably are less useful:

- Focus on and venting of emotions
- Behavioural disengagement

- Mental disengagement
- Alcohol – drug disengagement

Schema therapy defines three ways to deal with schemas, or coping styles:

1. Surrender
2. Avoidance
3. Over-compensation (showing the opposite behaviour in order to fight the schema)

In the short term, these coping styles can provide some relief, in the long run, they lead to difficulties in essential areas of life. Using a coping style is generally not a conscious choice, but an automatic reaction to a difficult or threatening situation. Coping styles may be particularly visible in the behaviour of the client, but they also contain cognitive transformations. Normally, clients only have one coping style; this may be, for example, surrender, which is dominant. Activating the self-sacrifice schema for a long period and in a very intense manner, in which thoughts about wishes and interest of others are prominent, finally leads to exhaustion and growing urge to see one's own needs fulfilled (Genderen et al., 2012). People who are sick with stress often, not always, feel exhausted, maybe the reason is that they surrendered to the self-sacrifice schema.

Modes

Modes refer to the predominant emotional state, schemas, and coping reactions that are active at a particular time in an individual. Modes are by definition transient states. This is in contrast to schemas, which can be thought of as traits – a person's stable characteristics. At any given moment, a person is predominantly in one particular mode. In social–cognitive terms, it can be thought of as a working self–concept. The part of the person´s self or identity, which is primed or active at the moment and which drives the way people anticipate, see, and respond to the world around them (Rafaeli et al., 2011, 47). Every person has the capacity to be in a variety of modes over the course of the day or week, and certainly throughout their lifetime (Rafaeli et al., 2011, 48). A healthy person moves between modes but retains a unified sense of self. He or she can simultaneously experience blends of modes – more than one mode at a time. When the person shifts between modes, it happens gradually and not abruptly. It is easier for a healthy person to recognize and acknowledge the modes, e.g., a healthy person is able to conclude "I´ve been feeling more upset and needier" when realizing

the vulnerable child mode. Furthermore, the healthy person is probably able to identify the triggers for the ascendance of this mode at the very moment (early warning signs). Schema therapy does not see pathology as qualitatively different from healthy functioning in this regard: all people have different sides of themselves; every person owns multiple modes. What is lost in severe pathology, is the ability to balance the modes, to reconcile their competing styles and impulses, and to manage seamlessly transitions among them (Rafaeli et al., 2011, 48).

There are four main types of modes:

- Child modes:
    - Vulnerable child
    - Angry child
    - Enraged child
    - Impulsive child
    - Undisciplined child

- Maladaptive coping modes:
    - Compliant surrender
    - Detached protector
    - Overcompensator
    - Self-aggrandizer
    - Bully and attack

- Dysfunctional internalized parent modes:
    - Punishing parent
    - Demanding parent

- A healthy adult mode:
    - Healthy adult
    - Contended child

(Rafaeli et al., 2011, 67)

Needs…

A traditional source looking at needs is Maslow´s hierarchy (Figure 6). The needs are related to each other and arranged in a hierarchy of prepotency. When the most prepotent needs, for example, hunger and thirst (bodily gratifications), are satisfied, then the next level, in this case safety needs, run into focus (Maslow, 1943a, b).

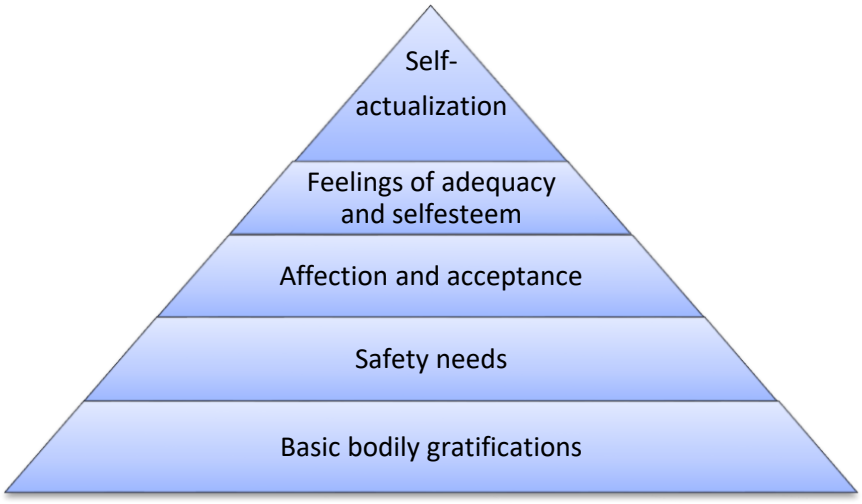

Figure 6: Maslow's hierarchy of needs (Maslow, 1943a, b).

Whereas Maslow conceives needs in a hierarchy, schema therapy does not state a hierarchy, but defines the following needs as equally important and activated at the same time. Schemas emerge from unmet core emotional needs early in life. Schema therapy defines universal core emotional needs as:

- Safety
- Stability
- Nurturance and acceptance
- Autonomy
- Competence
- A sense of identity
- Freedom to express one´s needs and emotions
- Spontaneity and play
- A world with realistic limits which fosters the emergence of self–control

(Rafaeli et al., 2011, 7)

Everybody has these emotional needs. Though they can vary from individual to individual in strength. Some people may have a stronger temperamental need for spontaneity and creative expression, some may be particularly wired to crave nurturance. But above and beyond these individual differences lies a universal similarity – we all, fundamentally, have some amount of all these needs. They are present from childhood and in fact most are at their strongest in childhood (Rafaeli et al., 2011, 7).

According to Bach et al. (2015) the relevant schemas are the following. This dissertation puts an exceptional focus on the ones in bold letters:

1. Emotional Deprivation
2. Abandonment
3. Mistrust / Abused
4. Social Isolation
5. Defectiveness
6. Failure to Achieve
7. Dependence
8. Vulnerability to Harm
9. Enmeshment
10. Subjugation
11. **Self-Sacrifice**
12. Emotional Inhibition
13. **Unrelenting Standards**
14. Entitlement
15. Insufficient Self–Control
16. **Approval-Seeking**
17. Pessimism
18. Self-Punitiveness

The motivation of this dissertation, to focus on these three, was as follows:

Self-Sacrifice

The schema therapy definition of **Self–Sacrifice** is: "This schema involves an excessive focus on voluntarily meeting the needs of others, at the expense of one´s own gratification. Some common motivations for behaviour that is consistent with this schema are avoiding actions that may cause pain to others, avoiding guilt from feeling selfish, or maintaining a connection with others, who are perceived as needy. This schema often results from an acute sensitivity to the pain of others, and at times, leads to a sense that one´s own needs are not being adequately met and to resentment of those receiving one´s care." (Rafaeli et al., 2011).
The above mentioned Big Five showed relations to stress and self-sacrifice.
Conscientiousness is a trait that seems to prevent stress, both in physiological and self-report data (Murphy et al., 2012). Also, Kim et al. (2016) reported a higher degree of neuroticism and lower degrees of extraversion, agreeableness, and conscientiousness to be significantly associated with greater perceived stress and depressive symptoms. However, Tyssen et al. (2007) presented evidence that a combination of high neuroticism and high conscientiousness is particularly risky for experiencing more stress. Thus, a specific combination of personality traits can predict stress. Female students showed a higher level of stress.
Costa et al. (2009) divide conscientiousness into six facets under the factor: Competence (self-efficacy), order / organizing, dutifulness / sense of duty / obligation, achievement striving, self-discipline / willpower, deliberation / cautiousness. It could be shown that conscientiousness and neuroticism switch on the link between personality traits and stress.
Luo et al. put it this way: "Among the Big Five personality traits, the genetic components in **conscientiousness** and neuroticism made substantial contributions to the genetic link between **personality traits and perceived stress** across both studies" (Luo et al., 2017).
Expert 1 (2015) emphasizes the role of perfectionism: "Then there is also **our own level of ambition** which, to that extent, is increasing. All these norms they have to live up to. The young men do not have it quite the same way. A typical example of this is when you go out and ask the people if they are stressed, shows that the young girls **are the ones who are getting more and more stressed because they are extremely controlled by other–directedness".**

Approval - Seeking

This schema involves – according to Rafaeli (2011) – an excessive emphasis on gaining approval, recognition, or attention from other people, or on fitting in, at the expense of

developing a secure and true sense of oneself. For individuals with this schema, one´s sense of esteem is dependent primarily on the reactions of others rather than on one´s own natural inclinations. The schema sometimes includes an overemphasis on status, appearance, social acceptance, money, or achievement – as means of gaining approval, admiration, or attention (but not primarily for power or control). It often results in major life decisions that are inauthentic or unsatisfying, or in hypersensitivity to rejection.

Unrelenting Standards

This schema involves the underlying belief that one **must strive to meet very high internalized standards, behaviour, and performance** (Rafaeli et al., 2011). The motivation often is to avoid criticism. It typically results in feelings of pressure or difficulty slowing down and generating hyper-criticalness towards oneself and others. Impairment in pleasure, relaxation, health, self-esteem, sense of accomplishment, or satisfying relations prevail. Unrelenting standards typically manifest as: (a) **perfectionism**, inordinate attention to detail, or an underestimate of how good one´s performance is relative to the norm; (b) **rigid rules** and "should" in many areas of life, including unrealistically high moral, ethical, cultural, or religious precepts; (c) **preoccupation** with time and efficiency (Rafaeli et al., 2011).
Flett et al. (2016) conclude that the current findings provide general support for models of perfectionism and stress and suggest that **perfectionists** have **heightened sensitivities to stressors** related to their self-definitions that are activated when threatening stressors involving these themes are experienced.
Expert 3 (2015) reports from her practice "When talking to stressed people, there are some who are so busy **doing things well** and staying on and may have been taught that when I encounter a problem, whether it is some (stress) symptoms or something work-related, 'I' take myself more together and make me more anxious. I think maybe some of it can be related to such a psychological mechanism that you keep on coming together and doing a little more. And then there are some who can stick to it longer than others can."
Expert 1 (2015) advises that perfectionism has something to do with parents. Firstly, parents can push levels of ambition. Then, parents can be absent, so that they are not available as role models. Probably both aspects are contributing and interacting causes. Going to school and talking about this may result in bullying. Thus, the **levels of ambition** in childhood are important originators of stress in adult life.

Different studies find that there is a link between perfectionism and stress. (Bottos, S., & Dewey, D., 2004) conclude that considerable research has subsequently confirmed associations between **perfectionism** and **stress**.
Flett et al. (2016), considering several authors, state "Moreover, several studies have found that stress acts as a mediator or moderator of the link between **perfectionism** and **psychological distress** as well as the link between perfectionism and health problems (Dunkley et al. 2003; Enns and Cox 2005; Flett et al. 2012; Mandel et al. 2015; Molnar et al. 2012; Nilsson et al. 2008)".

According to Ghasemian (2017) "It can be concluded as nurses with type **A personality are more prone to have stress** than nurses with type B personality". Factors of type A behaviour pattern includes tenseness, impatience, restlessness, **achievement orientation**, domineering, and workaholic. Factors of type B behaviour pattern include complacent, easy going, non-assertive, relaxed, and patient behaviour. Type A physiologically is connected to the sympathetic and type B to the parasympathetic nervous system.

„... when you report your own research, you add your voice and hope that other voices will respond to you, so that you can in turn respond to them ". (Turabian, 2018).

Jeffrey Young's Schema Therapy Questionnaire YSQ will be used in this dissertation as main instrument to measure prevailing schemas.
I chose to let my research focus on the above mentioned three schemas on the basis of the following arguments. There has been no earlier research on the combination of stress and schema therapy. However, the literature used in the introduction of this dissertation give rise to a connection of schema, stress, and sickness. The choice of self-sacrifice, unrelenting standards, and approval seeking, as schemas to formally test hypotheses on, was based on my own clinical knowledge and experience. The three interviews in the qualitative part of this dissertation also suspected the three as most pathogenetic. Finally, the scientific supervisors at the universities strongly supported the three as crucial: Susanne Vind (psychiatric senior physician in Denmark), Sven Thönes (University of Mainz, Germany), Joachim Vogt (Technical University of Darmstadt, Germany), and Claudia Harzer (University of Greifswald, Germany).

The **Self-Sacrifice schema** was chosen because people with stress very often has a focus on helping everybody else. They offer their help on the one hand, but on the other, they can´t say no when being asked for help. The motive could be the anxiety to be rejected or not to be liked in case of a refusal. On the long run, self-sacrificing people forget to take care of themselves.

Often people sacrifice themselves to get approval from others. That is why the **Approval – Seeking schema** is connected to self-sacrificing and included in the focus. This need for an extremely high amount of approval is often associated with lacking self-confidence and self-esteem. In his theory, Young suggest a connection between parents or significant others being tight-fisted with satisfaction of basic needs of their children with later unnaturally increased approval seeking.

Unrelenting Standards is probably also connected to the two schemas above. Trying to be perfect and act perfectly forces to strive for control. Without control, perfectionism will go down the tubes.

Research question and hypotheses

The dissertation will answer the research question, whether stress sickness is associated with similar schema values. It is expected that especially self-sacrifice, unrelenting standards, and approval-seeking are higher in the client group relative to the control group. This hypothesis will be tested formally.
Less formally, it will be discussed, how information about schema values and stress could be used to help people being sick with stress.
Finally, possibilities of preventing stress sickness in the society and its subsystem will be debated.

Three hypotheses will be tested, i.e., that the client group relative to a control group, would report more experiences of each of the following three schemas:

1. **Self-sacrifice**
2. **Unrelenting standards**
3. **Approval-seeking**

Methods

Participants

Client sample

The client sample consisted of 100 Danish-speaking adults over 18 years being part of the working population (25 men, 75 women). Their mean age was 43.42 years (SD = 9.12; range: 20–66 years). Age was normally distributed. In line with the requirements for participation (see appendix, pages 88 and 89), all were in treatment for being sick with stress.
As mentioned in the introduction chapter, there is no official way to detect stress in Denmark. Typical symptoms reported by the clients, were that they had not been sleeping well for a long time, they were not able to concentrate, they had "lost" their ability to remember things, they did not feel well, they could not feel themselves, they had lost contact to themselves in many ways, that for a long time they had not felt happy, that they had symptoms in their body e.g. distress in their body, *but there was no medical answer to their symptoms.*
The author recruited from her own clients and received referrals from colleagues with their own psychological clinics all over Denmark. Each participant received a paper-pencil version of the YSQ-S3 among other measures, a description of the study (appendix, pages 87 and 89), and filled out an inform consent sheet (appendix, page 88). Additionally, the subjects were informed that they would not receive personal feedback regarding their individual scores. Participants did not receive any other compensation. Only the author of the present dissertation knew the participants' identity. When the data were processed in the SPSS-programme, their identity had been converted to a number, so that all data were anonymized.

Control sample

The control sample consisted of 50 Danish-speaking adults over 18 years being part of the working population (27 men, 23 women). Their mean age was 45.45 years (SD = 10.83; range: 24–61 years). Age was normally distributed. In line with the requirements for participation in the control sample, they had not previously been sick with stress. The controls were recruited from two specific organizations: Leo Pharma and the local police department.

Measure

The participants were recruited by the leaflets in the appendix (page 89). They were briefed on the study as necessary to be informed well enough for giving informed consent (page 88). They filled out the Danish version of the *Young Schema Questionnaire – Short Form 3* as a measure of the 18 schemas (*YSQ-S3*; Danish version by Bach et al., 2015, according to them developed on the basis of Young's publications from 2005). Due to the copyright, the original, full items cannot be written into this dissertation. In Siegmund et al. (2011), a German short version of Young's Schema Questionnaire is used and the items are presented in an abbreviated form.

The participants were asked to describe themselves by rating descriptive statements through 6-step Likert-type items ranging from 1 = "completely untrue of me" to 6 = "describes me perfectly". Higher values indicated a stronger presence of the respective schema. The 18 schema scales included five items per scale, resulting in a total of 90 items. The YSQ-S3 was initially translated into Danish by an advanced-level certified schema therapist (Susanne Vind) with assistance from an authorized translator. Subsequently, a final blinded back-translation was carried out by a bilingual authorized translator (Bach et al., 2015). For the purpose of the present study, the Danish version was again back translated to check equivalence between the Danish and the original English version. The translator found that there were 90-91% agreement between the original and the back-translated questionnaire. The Danish YSQ-S3 *proved to be a reliable and valid measure* (Bach et al., 2015). *All factor loadings (standardized regression weights) and factor reliability coefficients were satisfactory (exceeding the desired thresholds of .40 and .70, respectively) (*Bach et al., 2015). According to Bach et al. (2015), the theoretical factor-structure was weak but sufficiently represented.

It can be concluded that the YSQ-S3 is a psychometrically valuable instrument for the assessment of maladaptive schemas in both clinical and *research settings*. For copyright reasons, no English original items of the YSQ are presented in this doctoral thesis. Interested readers, who cannot read Danish, may consult The European Journal of Psychological Assessment and the article "The Young Schema Questionnaire 3 Short Form (YSQ-S3); psychometric properties and association with personality disorders in a Danish mixed sample, 2015 published by Bo Bach, Erik Simonsen, Peter Christoffersen, and Levente Kriston.

A major difference in the client samples here compared to the Bach et al. study is that Bach et al. recruited people connected to the Danish psychiatry. It therefore is an in-patient group study. In this study, the client sample are people above 18 years that are part of the working force. Maybe you could call it a study of an “out group”. Certainly, there must be an overlap of these groups, people connected to psychiatry are also working and vice versa. However, the differences of the studies in general and specifically in confounding (Bach et al.’s design has less) remain.

Procedure

There was a clear point of contact in each organization: Tina Høholt for LEO Pharma and Deputy Police Inspector Torben Svarrer.

A project outline (see appendix page 88) and a project description were distributed as flyers and short papers (see appendix page 89). They slightly differed, for example, in that the control group flyer asked for people no stress sickness. Informed consent was given by every participant, client and control alike (see appendix page 87). The procedure was in many aspects consistent with the much younger European General Data Protection Regulation (GDPR). The flyers stated that the participation is completely anonymous and voluntary, i.e. there were no disadvantages from not taking part. The document gave a point of contact with email address and explained potential risks. One GDPR requirement, however, was not fulfilled: the participants had to sign that they would not get access to their results. This omission was necessary, because a researcher should not reveal and discuss clinical data for the sake of patient safety. This should be done one-on-one by the therapist.

The questionnaires were collected by means of ballot box, which was securely locked and theft-proof fixed to the wall. Once in a week, the author of this thesis collected them.

Results

Preliminary analyses

In the preliminary analyses, the presumptions of further testing were inspected. As Table 4 and the following argumentation show, there were no serious doubts that the data are sufficiently normal distributed.

Table 4. Descriptive statistics and reliabilities of the YSQ-S3 scales in the total sample N = 150.

YSQ-S3 Scales (Schemas)	*Min*	*Max*	*M*	*SD*	*S*	*K*	α
Emotional Deprivation	1.00	4.60	1.73	0.80	1.21	1.11	.75
Abandonment	1.00	5.60	2.23	1.13	0.86	0.02	.85
Mistrust/Abused	1.00	5.20	1.86	0.91	1.28	1.41	.85
Social Isolation	1.00	5.40	1.97	0.99	1.16	1.00	.87
Defectiveness	1.00	5.00	1.65	0.82	1.66	2.96	.85
Failure to Achieve	1.00	5.60	1.99	1.05	1.20	0.99	.89
Dependence	1.00	4.20	1.55	0.68	1.62	2.71	.80
Vulnerability to Harm	1.00	5.20	1.94	0.99	1.14	0.69	.80
Enmeshment	1.00	4.60	1.69	0.85	1.43	1.39	.76
Subjugation	1.00	5.20	2.17	1.04	0.76	-0.31	.83
Self-Sacrifice	1.00	6.00	3.48	1.09	-0.01	-0.63	.78
Emotional Inhibition	1.00	4.60	2.24	0.94	0.65	-0.45	.72
Unrelenting Standards	1.00	6.00	3.26	1.18	0.04	-0.66	.79
Entitlement	1.00	5.00	2.45	0.86	0.62	0.01	.70
Insufficient Self-Control	1.00	4.80	2.27	0.83	0.65	0.06	.68
Approval-Seeking	1.00	5.60	2.83	1.05	0.24	-0.50	.81
Pessimism	1.00	5.60	2.18	1.14	0.87	-0.10	.87
Self-Punitiveness	1.00	5.20	1.80	0.88	1.40	1.81	.84

S = Skewness and K = Kurtosis calculated to check that the distribution of scores is approximately normal.

There are two main ways, in which data distributions can deviate from normal. First, a lack of the symmetry. In this case of skewness, the normal distribution leans too much to either side, which may indicate that there are some extreme values (outliers). Second, kurtosis or pointiness describes, how pointed the distribution is upwards. If it is very flat or very pointed, then it is not normally distributed. In a perfect normal distribution, the values of skewness and kurtosis are 0 (Field, 2014, 20). According to George and Mallery (2010), -2 and 2 are considered the thresholds, within which normal distribution can be assumed for S (skewness) and K (kurtosis). Two scales, defectiveness and dependence, exceed the threshold of 2, they are, however, not part of the hypotheses. All relevant scores in Table 4 are satisfactory for the purposes of this study.

Cronbach´s α, the internal consistency, a measure of the reliability of a scale (Field, 2014, 873), is used to check, whether or not the scales are consistent. It is also used as an indicator of validation. A generally accepted value between .7 and .8 is appropriate (Field, 2014, 709). Here Cronbach´s α is used for validation, because the scale has not before been used on Danish people over 18 in the labour market. Before the present study, it has only been validated on psychiatric wards in Denmark.

Main analyses

Table 5 shows the results of the main analyses. There are significant group differences with respect to the hypothesized schemas and in the expected direction.
The Danish version of the Young Schema Questionnaire – Short Form 3 (YSQ-S3) can differentiate the client sample and the control sample with the exception of entitlement. This is also what (Bach et al., 2015) concluded in their studies.

Table 5. Means and standard deviations of YSQ-S3 scales in the client sample and the control sample as well as t-statistics for between group differences (client vs. control sample)

	Client Sample (*N* = 100)		**Control (*N* = 50)**		**Between group comparison**		
YSQ-S3 Scales (Schemas)	*M*	*SD*	*M*	*SD*	*t*	*df*	*p*
Emotional Deprivation	1.89	0.85	1.41	0.59	4.05	132.79	.000
Abandonment	2.56	1.14	1.58	0.77	6.26	135.61	.000
Mistrust/Abused	1.99	0.91	1.61	0.86	2.45	148	.016
Social Isolation	2.12	0.97	1.67	0.98	2.68	148	.008
Defectiveness	1.82	0.88	1.29	0.53	4.59	142.73	.000
Failure to Achieve	2.23	1.04	1.52	0.91	4.31	110.43	.000
Dependence	1.71	0.73	1.21	0.37	5.56	147.92	.000
Vulnerability to Harm	2.13	0.99	1.54	0.86	3.58	148	.000
Enmeshment	1.83	0.90	1.42	0.65	3.13	130.22	.002
Subjugation	2.49	1.01	1.54	0.78	6.35	123.74	.000
Self-Sacrifice	3.82	1.00	2.78	0.94	6.11	148	.000
Emotional Inhibition	2.38	0.91	1.96	0.95	2.63	148	.010
Unrelenting Standards	3.61	1.06	2.57	1.09	5.61	148	.000
Entitlement	2.46	0.81	2.44	0.97	0.08	148	.936
Insufficient Self-Control	2.43	0.80	1.94	0.80	3.52	148	.001
Approval-Seeking	3.05	0.95	2.39	1.11	3.82	148	.000
Pessimism	2.47	1.14	1.61	0.89	5.04	121.86	.000
Self-Punitiveness	1.94	0.94	1.52	0.68	3.16	129.20	.002

Notes. Statistical significance after Bonferroni correction: $p < .003$ (= .05 / 18).

The samples were tested under the null hypothesis, that the means equal 3 and that they are not significantly different between groups. “As a rule of thumb (not a law of nature), inference about means is sensitive to skewness and inference about variances is sensitive to kurtosis.” (George & Mallery, 2010). The t-tests assume the null hypothesis that the value of b is 0.

Therefore, if there are significant differences, we gain confidence in the hypothesis that the b – value is significantly different from 0 and that the predictor variable contributes significantly to our ability to estimate values of the outcomes (Field, 2014, 303). It looks at the client group and the control group and compares whether these two groups are the same or different. If they are significantly different, then we assume the difference is not by coincidence. If the same type of people once more is tested, they should again score differently. The higher the t-value is, the smaller the error probability.

Table 5 shows that all three hypotheses are significantly confirmed after Bonferroni correction. Self-sacrifice and unrelenting standards are on average more than one scale point higher in the patient compared to the control group; the standard deviations are smaller than the differences of the means. Approval-seeking reveals a slightly smaller mean difference, but with the high degrees of freedom it still is significant with an error probability converging to 0.

Degrees of freedom relate to the number of observations that are free to vary. If one parameter is held constant, then the degrees of freedom must be one less than the number of scores used to calculate that parameter. The more degrees of freedom, the closer is the distribution to normal. Field (2014, 49) states caricatured: how much do I trust that normal distribution is present in this data? The results in the present study have sufficient degrees of freedom (Table 5).

Mean (M) is a simple statistical model of the centre of a distribution of scores. A hypothetical estimate of the "typical" score (Field, 2014, 879). **Self-sacrifice**, **unrelenting standards** and **approval-seeking** in the client sample all have an M higher than 3. Although the control group regarding these three schemas also reported higher M than in other schemas, the three relevant M are below 3 and significantly smaller than in the client sample.

The p values reflect the error probability and thereby the level of significance. The closer p to 0, the safer the result. The broadly accepted error probability is 5%, i.e., a p-value of 0.5, giving a 95% probability that the result not occurred by coincidence. For the present study, the Bonferroni correction of the accepted p value was applied, because multiple tests inflate the error probability. The Bonferroni procedure is a correction applied to the alpha type I error (significant result, although hypothesis is untrue), when multiple significance tests are carried out (Field, 2014, 871). The significance level is accordingly adapted. Bonferroni is a strict criterion and the results in this dissertation endure. The mean differences were significant even with this rather strict correction, the hypotheses can be considered true with 95% surety.

Summary of results

In summary, five new results are added to the international schema data base, among them two supporting my hypotheses:

1. The three schemas selected for the hypotheses, **Self-Sacrifice**, **Unrelenting Standards** and **Approval-Seeking** score on average higher than 3 in the client group.
2. There are significant differences between the groups indicating that clients have higher values in these three schemas.

Furthermore, there are three results not hypothesized in advance:

3. There is a significant difference between the two groups **on all schemas except entitlement**
4. With **self-sacrifice, unrelenting standards,** and **approval-seeking**, there are higher values for the client sample and the control sample, i.e., both score higher than they do on the other schemas (except entitlement, where both groups score high close to each other).
5. The Danish version of the Young Schema Questionnaire – Short Form 3 (YSQ-S3 can differentiate the client sample and the control sample with the exception of entitlement.

Discussion and conclusion

Research question - reminder

The dissertation will answer the research question, whether stress sickness is associated with higher schema values. It is expected that especially self-sacrifice, unrelenting standards, and approval-seeking are higher in the client group relative to the control group. This hypothesis will be tested formally.
Less formally, it will be discussed, how information about schema values and stress could be used to help people being sick with stress.
Finally, possibilities of preventing stress sickness in the society and its subsystem will be debated.

Hypotheses

Three hypotheses were tested, i.e., that the client group relative to the control group would report more experiences of each of the following three schemas:

1. **Self-Sacrifice**
2. **Unrelenting Standards**
3. **Approval-Seeking**

Did the results answer the question in support of the hypotheses?

Regarding **self-sacrifice, unrelenting standards** and **approval seeking**, the client sample, **but also** the control group, scored higher than on the other schemas; in the client sample, the means were well beyond the scale mean of 3 and significantly higher compared to the control group (except entitlement, in which both groups scored highly and close to each other). **The hypotheses of higher scores in the client group was confirmed**: M of the three focused schemas were in the unhealthy part of the scale above 3 and higher than in the control group. **M Self-Sacrifice = 3.82, M unrelenting standards = 3.61, and M approval-seeking = 3.05.** As predicted, the control group had scores under 3 on the schemas (the healthy end of the scale), M self-sacrifice = 2.78, M unrelenting standards = 2.57, and M approval-seeking = 2.39. Apart from entitlement, where both groups scored roughly equal and beyond the healthy range, the three selected schemas were also higher than the other schemas in the control group, underlining that the focused schemas are the most problematic also in healthy controls.

It may be that these schemas are the most sensitive to everyday stress and therefore more represented in the general population - sick with stress or not.

Hypothesis 1 therefore is confirmed. The results show that there is a significant difference between the two groups on **self-sacrifice**, the client group scoring beyond 3 and higher than the controls. Also, **hypothesis 2** regarding **unrelenting standards** and **hypothesis 3** about **approval-seeking** are supported by the data. Moreover, on all other schemas, except entitlement, the client group reveals higher means. This makes it more complicated, if at all possible, to find out, which schema or maybe combination of schemas, is the main driver of sickness with stress. This would require more than the cross-sectional study presented here: a longitudinal and randomized control trial.

Concerning entitlement, not identifying the client group with a mean above 3 and not distinguishing the groups, Bach et al. (2015) also found problems: "Although *the scale of Entitlement exposed some minor problems regarding reliability and factorial validity, we still consider it appropriate to be used without the need for a substantial revision*". Regarding this scale, questions remain open and against the conclusion of Bach et al., the scale is worth to be further developed and a substantial revision is desirable.

Research question 2, **how that information may help the people who are already sick with stress,** cannot be answered with the data from this study. The results have shown, which schema profile is characteristic for patients and (except entitlement) separates them from healthy people; also, self-sacrifice, unrelenting standards, and approval-seeking were confirmed as the most relevant schemas. However, but this does not help people sick with stress and future research, recommended at the end of this discussion, must answer this question.

Question 3, whether **knowledge can be facilitated by the society and its subsystems (e.g. the health system), to prevent healthy people becoming sick with stress,** was not planned to be formally tested. However, the Danish version of Young's Schema Questionnaire – Short Form 3 (YSQ-S3) – proved able to differentiate the client sample from the control sample. Further research using the YSQ – S3 and explicated below, will be successful in complementing the answers to this question.

This study says something about people already sick with stress. As prevention has priority over intervention (Vogt, 2019), it is necessary to know and treat the schemas before they get pathogenic. If the pathogenetic schemas are identified, the clients must have access to prevention tools. The general population as well as health organizations and especially

insurances together with employers are able to help BEFORE people get sick. If the schemas and their pathogenic potential are known, employers and health organizations are able to treat the straining people and the stressful working conditions, accordingly. However, the goal must be to PREVENT people from getting sick with stress in the first place.
The results are not helpful in identifying the critical time slot, in which people get sick with stress and whether or not the schemas were active at that time. Even if there is a general understanding that schemas are acquired early in life (according to Young et al., 2005; Roedinger, 2014), these maladaptive schemas are developed at an early age as a result of the interactions between factors such as the temperament of the child, the educational style of the parents, and any significant (sometimes traumatic) experiences (Genderen, et al. 2012). The design of this study is not conclusive on these issues. For such conclusions, a longitudinal study is mandatory, in which subjects are investigated from early childhood on.

Similarities and differences to Bach et al.

Bach et al. (2015) had three groups of participants:

1. 391 non-clinical participants (81.3 % females, mean age 29.4, range 18 – 56)
2. non-borderline personality disorder patients
3. borderline personality disorder patients

Group 2 and 3 together consisted of 176 psychiatric patients (71.6 % females, mean age 29.3, range 18 – 56). Apart from the division of the patient group into 2 subsamples, the group contrasting juxtaposition of Bach et al. is similar to this dissertation's between-group comparison.
Bach et al. could not fully randomize the selection of their participants. The variance of the YSQ scores in the demographic characteristics ranged broadly. The representative clinical subsample was matched to the non-clinical subsample.
The patient sample of Bach et al. and the client sample in this study look alike. gender distribution and age ranges are similar. However, the clients described in this dissertation were on average 14 years older than in Bach et al.
Bach et al. had some control over the selection of study participants, although they could not fully randomize. In this study, however, no randomization at all was possible. There are several confounding factors, for example, the controls were recruited from two specific companies. Moreover, gender representation was different. The client sample had 75%

women and 25% men. In the control sample, the ratio was closer to reality with 46 % female and 54 % male.

Bach et al. stated that based on the total sample, internal consistency was sufficient for all 18 scales (Cronbach´s alpha higher than .70 in all scales).

In Bach et al.'s Figure 1, the mean schema scores are presented. Like in the current study, the non-clinical participants rate in most scales well below a mean of 3 in the healthy part of the score. Also similar is that self-sacrifice, approval seeking (Bach et al. write admiration seeking), and unrelenting standards were the highest scores of the non-clinical participants of Bach et al. Like the control group in this dissertation, the non-clinical participants of Bach at al. are most at risk with respect to these three schemas. In quantity, the Bach at al. non-clinical participants rate similar or slightly higher than the Hovgesen controls.

The similar schema patterns of the control groups in both studies can be interpreted as a concurrent validity indication. The patient groups, however, differ within Bach et al.'s study and relative to the data in this doctoral thesis. The intra-study difference of borderline and non-borderline personality disorder patients seems to be mainly quantitative and expectable as the same kind of disease comes in two intensities. The quality of the schema profile with peaks (e.g. self-sacrifice, unrelenting standards, but also abandonment and pessimism) as well as shallows (e.g. mistrust, vulnerability, and enmeshment) is quite similar to the control profile in this dissertation. In comparison with the scores of our client sample, the scores of Bach et al. patients are similar or higher, some clearly higher.

Ethics and dilemmas

If I had succeeded in finding exactly, which schemas individuals sick with stress have, it would have been both, an ethical problem and a dilemma. The ethical problem is that the organizations involved could by reading this thesis accordingly select future employees on the basis of healthy schemas. Even worse, they could make the YSQ obligatory and then fire people with unhealthy schemas.

The dilemma consists of the above-mentioned unethical use of the data on the one hand. On the other hand, the organizations involved could use the results of this dissertation to further develop their workplace health promotion. This would certainly help people already sick as well as preventing sickness of healthy people with hidden unhealthy schemas. Moreover, both groups, already sick and still healthy, could use schema therapy tools. The inner detractor, for example, causing intrusive thoughts of guilt, fear, and rage could be domesticated. The inner

child, the preceding mode, could be taken by the hand and accompanied by the adult (another mode in schema therapy). All these tools require knowledge about one's own schemas and how they emerged.

The individual level and stress

It would most probably help the individual, if she or he becomes aware of unhealthy schemas and the when as well as how of acquisition. Awareness is the first step for the individual to start changing the present behaviour and newly assess the past circumstances. This probably must be achieved with professional help from a therapist having permission and knowledge to use the YSQ-S3 questionnaire. The Hobfoll iceberg model (Hobfoll, 1998, Figure 5), however, predicts that this treatment is not enough, as the pathogenetics are much more complex. The self-report, the illusions based on individual biases, objective factors accurately reported, illusions based on cultural, shared and familial biases, objective factors interpreted on cultural norms, and objective factors interpreted on family norms, still influence the individual, the coping capacity and therefore the individual's stress levels. Moreover, the individuals are influenced by the experiences in their organizations, where they work and probably suffer from stress. Society also contributes, for example, by prescribing Corona lockdowns. They are necessary, however, the lock-downs cause stress by loss of social support and increased private challenges, e.g., by decreased institutional infrastructure for childcare.

The organizational level and stress

To open up for the personal vulnerabilities in an organizational context can be stressful for everybody. Telling people, what their vulnerabilities are, needs a very safe, understanding, compassionate, and empathic approach. In most cases, organizational cultures do not achieve these standards.

On the organizational level, there are the individuals' schemas that can be unhealthy, also in a working context. On the other hand, there are factors, visible and invisible, as shown in the conceptual model of organizations (Hatch and Cunliffe 2013, 16, Figure 3) and the levels of culture model (Schein 1992, 17, Figure 4). They represent a horizontal and a vertical model of factors that affect the individual in the organization (Hatch and Cunliffe 2013, 16). This again represents the horizontal model, where impact factors are prevalent in the environment as power, culture, social structure, physical structure, and technology. Schein with his vertical

model shows that the individual is influenced by the artefacts that are the visible organizational structures and processes and hard to decipher, the espoused values in form of strategies, goals, and philosophies. Espoused justifications and basic underlying assumptions that are unconscious, taken-for-granted beliefs, perceptions, thoughts, and feelings. They are, according to Schein the ultimate source of values and action. They all can either be stressors in the working environment or sources of psychological growth (Strøbæk & Vogt, 2013).
To find out, what the individual perceives as unhealthy stressors in their work, the organization must conduct a survey and give each employee time during working hours to answer this survey. The survey should include all the known possible stressors – e.g. work time, working hours, type and amount of working assignments, psychological and social environments, relations to the leaders, the support from and access of the leader. Moreover, office facilities, open space and noise, the amount and lengths of breaks, technical and other support offered or lacking e.g., an exercise and relaxation room as well as materials (Vogt et al. 1999), yoga, meditation, mindfulness lessons, and a canteen with healthy food.
When the employee has filled in the survey, then human resources managers together with leaders and employees should have meetings on a regular basis discussing the stressors and countermeasures. The balanced scorecard (Möller et al., 2008) is a useful vehicle to monitor stress and – for the management very interesting – the impact of anti-stress measures on sick leave days, thus causing also monetary benefits (Köper & Vogt, 2004; Vogt et al., 2004). Furthermore, the anti-stress measures and their continuous monitoring as well as improvements are clear signals to the employees that their concerns are taken seriously (Hinton & Burton, 1992). The organization often realizes by the balanced scorecard and the proven impact of anti-stress measures on company success that employees are more a resource than a cost. Reducing staff loses its pretended financial benefits in favour of hiring more people. Leaders and managers (for the difference see Chmiel, 2000), who start listening to their employees and consider, what the employees feel and think about workplace stressors, will have less people on sickness leave and in the key performance indicators saved money will appear on the bottom line.

Inspirations from interviews with the experts

Business leaders need to be much better in employee-orientation. Managers, who can choose and plan the work for people, should do this in a way that people do not get stressed. As management seminars often recommend democratic and employee-oriented leadership as

always superior, mangers on their return often experience a self-fulfilling prophecy (Kristensen, 2007), that this cannot be true. The reason is that seminar trainers often not scrutinize the research and textbooks; thus, they do not explain that democratic and employee-oriented leadership is only superior, when there are complex tasks, capable employees, and enough time. Especially the latter presumption is very often not given, so that the democratic and employee-oriented approach is inferior. According to Expert 2 (2015) it is a bankrupt statement for managers, if they cannot prevent their employees on ward getting sick with stress.

The organizations need to be able to capture the stress signals their employees give them early, so that they react and get adjusted to the conditions that cause people to be stressed (Expert 1, 2015). But to capture the stress signal, you need to know what to look for, so the top management and the middle management are capable dealing with it, requires to be educated in stress: “We simply dressed them to know what stress is. And then they had a day where they had to go through how to deal with the stress of their employees or planning the work. We used role-playing games for this” (Expert 1, 2015). For 10 years, the international norm ISO 10075 is in power. Some countries like, for example, Germany (Vogt & Strøbæk, 2015) have implemented laws obligating managers to monitor and counteract especially mental stress and strain. Physical expositions, measures and insurances against them, have been subjects of the German work force protection laws since the late 19th century (Bismarck), anyway. Many managers consider this obligation a challenge and try to just fulfil it. There definitely has to be a change of attitude among managers towards employees as resource, not cost. Also, according to Expert 1 (2015), the managers must be “service employees". They need to make sure their employees are doing well.

It could be part of the yearly management evaluation, at best quantifiable with the above-mentioned balanced scorecard: if managers need to be measured on something, then they must also be measured on their success in reducing sickness leave among their employees due to work stress (Expert 1, 2015). The management has to be visible and nearby their employees: they need to be very physically close to their employees so they can get to know the employees’ concerns (Expert 1, 2015). This would also give them a chance to feel, hear, and identify what is going on with the individual. Furthermore, they easier will find out, if there are problems in the working environment with, for example, bullying (Høgh, 2005). “About workplace bullying, we have found that people who were exposed for bullying sleep less. Sleep is one of our really good parameters for measuring, how well we recover. An equally good stress response, a physiological response”. (Expert 2, 2015).

The society level and stress

The factors that are mentioned under organizations above are the same for the society, which is a large-scale organization. Laws enforcing occupational health and safety (see above the example of ISO10075 and Germany) must be put in effect by legislation (society) and put into practice by companies (organizations). Expert 2 (2015) suggests that it is necessary for the society / the political system to make something that has economic consequences for the organizations, if they do not have a focus on stress and how to prevent the employees from being sick with stress: it is necessary to stop this "stress epidemic" we are experiencing in Denmark. The organizations do nothing about it themselves. Because in the end, it is about plus on the bottom line. They are happy for employees, who do not say no, take on extra tasks, help colleagues. But they are being ruthlessly driven and it must be stopped. The only way to get it stopped is by making some political measures that will have consequences for the organizations / their economy. Once they have noticed it, they will probably start figuring out how to take care of their employees. (Expert 2, 2015).

Infrastructure also influences peoples' lives, for example, commuting to work can be stressful indeed with traffic jams and time pressure. Private life should offer possibilities to unwind after work. Do employees get a place to live with the income they have? Are there busses and trains that can take them to work, to pick up their children in institutions? Are the roads dimensioned to the amount of traffic or are there too few lines on the motorway or only one line on the highway, so it takes "forever" to get home and it "eats up" time being otherwise available for selfcare and rest, to give your children, partner, your family attention, and to all the practical things that are needed to do, buy food, cook, clean, wash clothes just to mention a few.

Like organizations, the society (including the government and the political system) could survey the citizens. Thus, the individual in their role as citizen can give feedback (role of employee to be covered by the companies), on what they think and feel about stressors in the community. Moreover, it is recommended to also ask the citizens to come up with solutions. This would probably cost the society money to make changes that were suggested. On the long-term, like the companies, the society would save money in form of reduced cost for e.g., unemployment and sickness as well as social welfare payments.

As an example, to reduce stress and that the society can do something about, Expert 1 (2015) suggests that people could work part-time or that they could accumulate time, which can be used for one partner to go on a reduced time during the transition, when the kids are small.

Expert 3 (2015) is suggesting the same: “Maybe you need a working time bank. That you use the resources when you are young and then when you get older, you can better work the ‘money in’. You can imagine working hours when you have children under 10 years, that you do not have to work 37 hours, but you can work e.g., 28 hours. But in turn, when the children have reached a certain age, one must expect to work more.” Another suggestion from Expert 3 (2015) was that parental leave is distributed equally.

An open issue is, how to obtain money on the short-term, which will give return on investment (Leonhardt & Vogt, 2007) only on the long-term? The standard answer is to raise the taxes for all, or for the people with high incomes only, and to feed the return on investment back into the system immediately when it occurs.

Managers discuss this theme in the different ways described above. Does a country like Denmark need to be rich in monetary terms? How much money does a society actually need? Should it not be spent on the population’s basic needs? Maybe it is possible to take that talk / discussion considering Maslow’s five basic needs (Figure 6): basic bodily gratifications, safety needs, affection and acceptance, feelings of adequacy and self-esteem, as well as self-actualization (Maslow, 1943). Schema therapy also offers a useful target structure with its definitions of the universal core emotions safety, stability, nurturance and acceptance, autonomy, competence, sense of identity, freedom to express one´s needs and emotions, spontaneity and play, realistic limits fostering the emergence of self–control (Rafaeli et al., 2011, 7). What does it cost to fulfil these needs? Of course, the answers will be diverse, depending on the respective perspective. One person might say that e.g., safety means a big salary, whereas others may see safety as just having enough money to pay a small place to live, clothing, and food. It most probably will not be easy to find consensual decisions on needs.

IF we as a society decide that we do not need to be rich, then the taxes can be reduced, work time limited and thus the stress resulting from pressure in the job will be reduced. Most probably, the number of people getting sick with stress will decrease.

IF we can agree that lasting joy and happiness do not come from owning things but from within ourselves; that it has nothing to do with material values, then material values loose importance. Most probably, the number of people getting sick with stress will decrease.

Since the birth of mankind, there have been individuals striving for a “simple life”, for example, Christian or Buddhistic nuns and monks. Often, these individuals report being happy and satisfied. It corresponds to schema therapy to give up material craving and balance life. And a life in which we probably would have less risk of getting sick with stress.

The pressure in the society "hits" everybody, even the children / youngsters feels it

During the interview with Expert 3 (2015) on the question, why the number of people getting sick with stress increases, she responded: "I think that is because something has happened in society, it is so important to succeed as a person. In the old days it was good enough to become a carpenter because that was what your father was. And then they took over the company. And the baker's son became a baker. Now it is very individual, and you have to have some wishes for what you have to be. It has become much more one's own job to be successful. I think there is so much focus on doing things right, to run a marathon, to eat special diets. There is no room for just to be happy with what you have and feel after you are well. I do not think you talk so much to children and young people that they really become aware of it. They are becoming more aware that they need the right phone or computers. Being on Facebook and those different things. There is a need for information and education about stress: 'information must be a very basic. Try to open your eyes to the fact that there are other things that are important. You have to catch them in elementary school. It is important to talk to them what can make one happy." (Expert 3, 2015). And there are different places to inform. It could be at the educational institutions. Schools need to take a few hours with their class teacher, who of course needs to be capable to discuss the whole stress issue. The classes should discuss where and how they are straining. It is hard for a young person to acknowledge stress (Expert 1, 2015). Another reason why it is a very good idea to have a special focus on stress and the youth and the young people in the society is that "cumulative adversity shapes personality development in young people." (Shiner et al., 2017).

Suggestions what we as the society could do

In order to stop increasing stress in children and young people, the society could develop ANTI - STRESS programmes towards the elementary schools, the high schools and universities to psycho-educate about stress and make it mandatory for the students to participate in workshops about stress. Questions like what stress is, how we realize it, what we can do to take care of ourselves and how we can identify it in the people and friends around us and how to discuss it with them. It could be implemented as a subject in school at the same level with mathematics where you get a grade. It could start with giving the teachers a two-day course / workshop about stress and in the material that specifically is made for the students. At the same time, there could be held workshops for the students, where psycho-

education about stress takes place, the mental and physical stress symptoms are discussed, stress routines and how to break free, before the damage is too big.
All schools should have an ANTI – STRESS plan, as they have for e.g., emergencies. What they, as a schooling society, as teacher, as student, can do to avoid it. Moreover, interventions should be in place, when people already got sick with stress, they are worried about some others, who are close to stress illnesses. There should be a special focus on young women between 16 – 24 years, since studies cited in the introduction identified them as a vulnerable group. The Danes' Health National Health Profile 2017 (Danskernes Sundhed – Den Nationale Sundhedsprofil 2017; Sundhedsstyrelsen, 2018) showed that poor mental health and being stressed have risen especially among young women between 16 – 24 years. They have the highest incidence of 40.5%. Cutshall et al. (2016) also found that fatigue, stress, and digestive disorders are common especially among women and that a functional medicine programme may effectively manage chronic stress in women.
Other factors beyond childhood schemas that can cause mental and physical illness and thus worsen stress in the individual, but which can be changed, are discussed in the following. As mentioned before, schemas are something, we are born with and they have developed over a long period of time; accordingly, they are difficult to change. But how we treat the body with e.g., food, drink, smoking, alcohol, medicine, lack of exercise or what we are exposed to from the outside environment e.g. pollution, noise etc. has an impact too, for our physical health for sure, but there is also evidence about a strong connection between unhealthy lifestyle / unhealthy environment and stress. The Danish National Health Profile 2017 (Sundhedsstyrelsen, 2018) found that the health of the Danes in many areas is getting worse. "*Many are overweight and eat unhealthily, and many moves too little*" (Sundhedsstyrelsen, 2018). And as mentioned earlier (Araiza et al., 2018), the associations of stress with eating behaviour are observed quite consistently, with some variability due to individual differences. What IF some of this overweight, eating unhealthily and moving too little is actually down prioritized by individuals under high pressure? It may partly be something that has to with the biology with e.g., increased cortisol levels causing the body to crave the unhealthy food. What happens, if the high cortisol levels meet high pressure from behaviour / thoughts due to unhealthy schemas, pressure from the organization, and pressure from the society? It is a vicious cycle, indeed, and causes cost that – if prevented – could be invested in the health system (Figure 7).

A simple model for the national macro-economy cost for the society

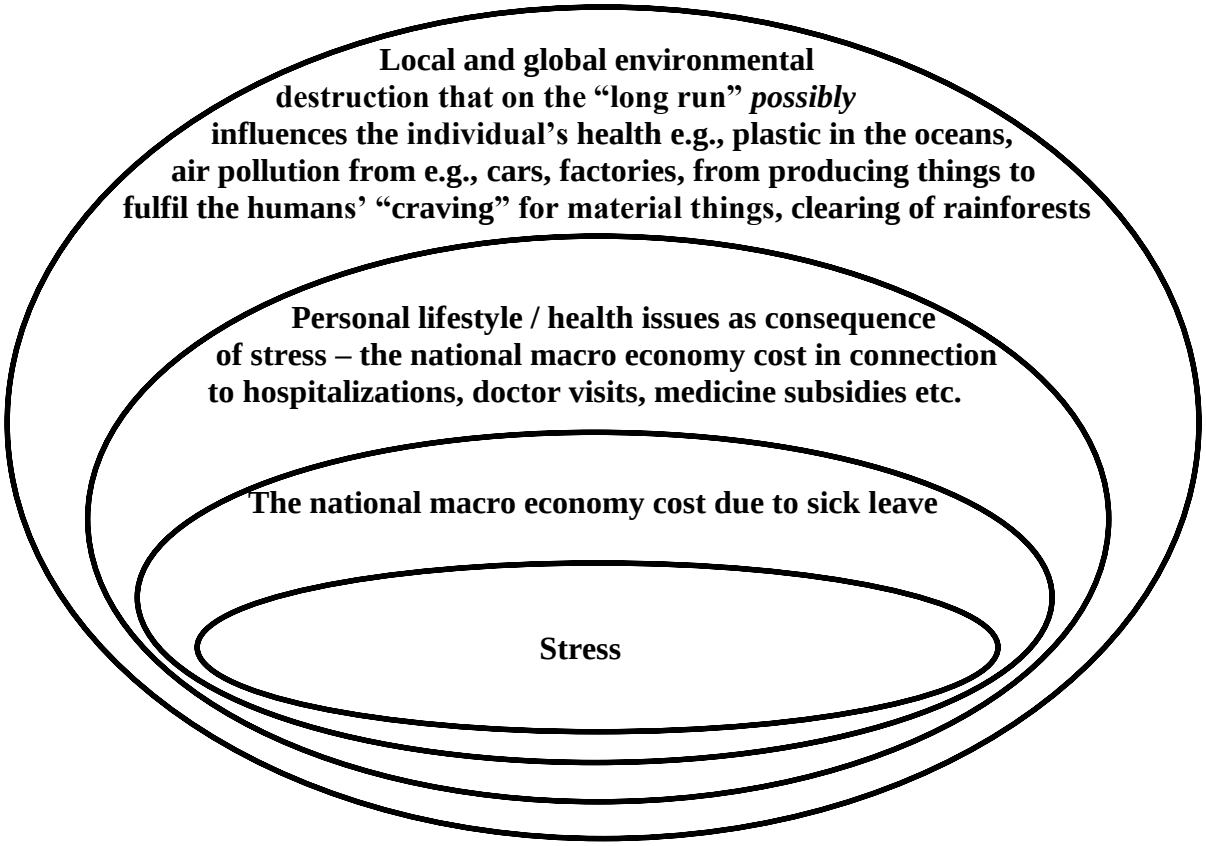

Figure 7. A simple model for the national macro economy stress cost for the society.

What can the society do against unhealthy lifestyles?

The price for fast-food, other unhealthy food and drinks, sugar, cigarettes could be increased. Some people might start going more often south of the Danish border to buy duty free, but maybe it would decrease of the junk food and soda that the young people buy today, and maybe more generally reduce unhealthy food and drinks, as well as cigarettes and alcohol. At the same time, the Danish tax legislation could differentiate more as many other countries, for example, Germany does. While increasing prices for the unhealthy food, drinks and cigarettes, the tax on healthy food and drinks could be decreased.

The society could subsidize healthy food and physical activity during working time. Laws enforcing nicotine prohibition during working hours, also outside buildings but on company and public ground, as well as campaigns supporting the use of bikes to commute or walk 10,000 steps every day. Laws that forbid advertising candy, sugar and energy drinks, are also making sense in terms of health promotion.

A stress – SW(V)OT analysis

In this chapter, a systemic way to look at stress solutions in terms of strengths that can be used, weaknesses that must be overcome, opportunities and threats resulting from the treaded path of recovery will be discussed.

Inspired by the SWOT model that was invented by two Harvard Business School professors – George Albert Smith Jr. and C. Roland Christiensen during the early 1950s (https://www.researchgate.net/publication/288958760_History_of_swot_analysis), a stress SW(V)OT analysis is suggested. The SWOT model is normally used as an analysis tool in organizations and well known. I changed the original **W** (weaknesses) to a **V** (vulnerabilities). The reason for this is that weakness in my perspective has a negative connotation. I have modified the model, since it is going to be used for human health and the word weakness with its negative connotation, is not suitable to change the situation to the better. Vulnerability, on the other hand, has a softness in it. Vulnerability is something we have to consider, to take care of, whereas weakness puts guilt on the individual and needs to get rid of. One might argue that the two nouns have the same meaning, but in my view, there is a big and important difference, therefore the change from W to V. Also, it is renewing the model and maybe more suitable for humans to use the V, whereas using W probably is more appropriate for the analysis of structure and economics in organizations.

Definition of Vulnerability

The source for this section is https://dictionary.cambridge.org/dictionary/english/vulnerability

The quality of being vulnerable (= able to be easily hurt, influenced, or attacked), or something that is vulnerable comprises, for example:

- A person has recently lost the mother; this critical life event, similar to others (Table 2) increases emotional vulnerability
- Some characters show more fears and vulnerabilities than others

Definition of weakness

The source for this section is https://dictionary.cambridge.org/dictionary/english/weakness

Weakness is the fact or state of not being strong or powerful. Any change of policy will be interpreted as a sign of weakness. A particular part or quality of someone or something that is not good or effective, for example:

- Any hesitation on the part of the government will be seen as weakness
- The latest conflict further illustrates the weakness of the UN
- An individual's inability to handle the situation is a sign of weakness

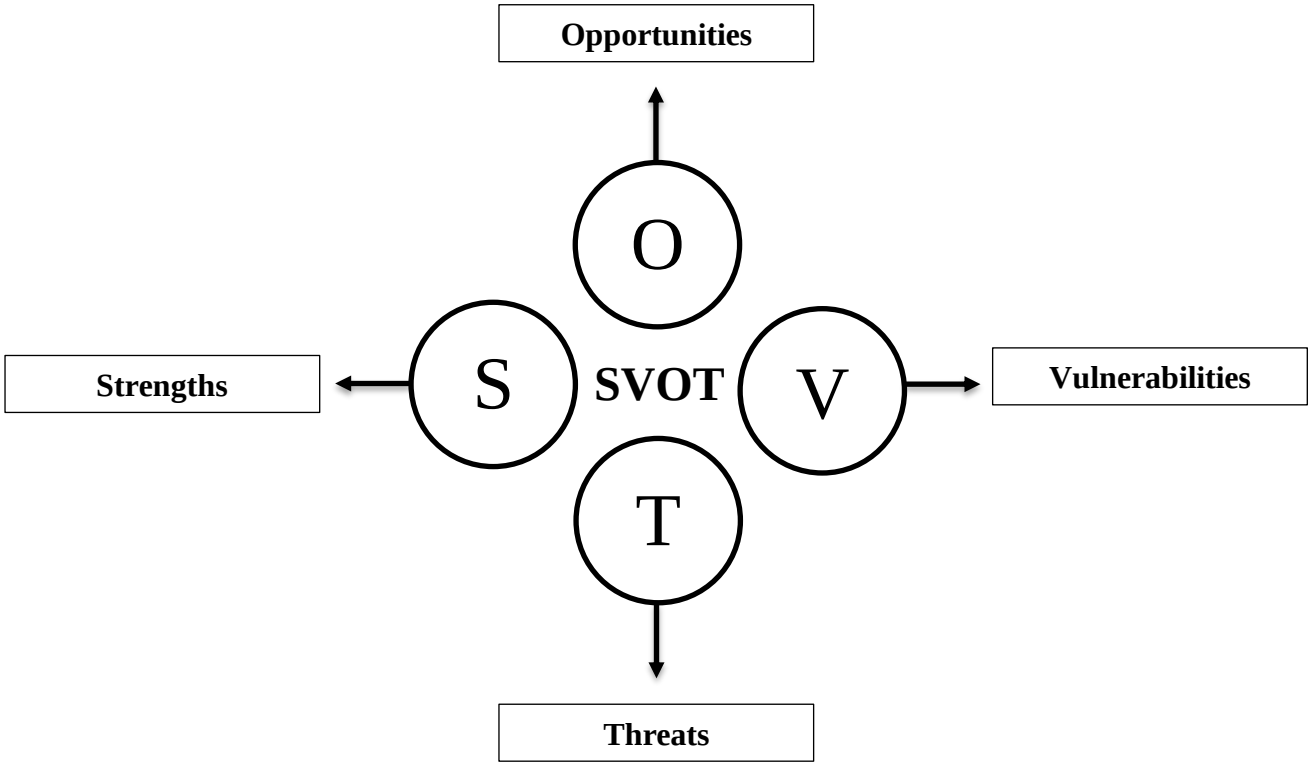

Figure 8. Stress – SVOT analysis.

S – what **strengths** does a person have that could be of help not getting sick with stress.
V (W) – what **vulnerabilities** does a person have that could be a risk for getting sick with stress e.g., unhealthy schemas. Having the same schema, but in the healthy range, does not create problems, it might even bring joy and happiness. It is when a schema becomes unhealthy, when it "tips over" it becomes a vulnerability.
O – which **opportunities** in the present e.g., outer resources, the people around at home and at work, routines, structures, rules help in daily life and can prevent getting sick with stress?
T – which **threats** are there in daily life that could increase the risk of getting sick with stress?

By making this analysis a "whole picture" emerges for the person and the people in the social environment. An idea of where there is potential "danger" that needs attention so the person can make early changes e.g., if there are threats or vulnerabilities which must be taken care of to avoid getting sick with stress.
In the following Table 6 there are examples of **S** – **strengths, V** –**vulnerabilities**, **O** – **opportunities** and **T** – **threats.**

Table 6. Examples of strengths, vulnerabilities, opportunities, and threats.

Strengths	Vulnerabilities	Opportunities	Threats
• Healthy schemas • Identify the character / signature strengths because character strengths are trainable personal characteristics, and therefore valuable resources to improve coping with work-related stress and to decrease the negative effects of stress in working life (organization) or with the pressure from the society (Harzer and Ruch. 2015a, b)	• Unhealthy schemas • Life stressors – past and present environments • Trauma, thoughts, behaviour, beliefs	Private life and conditions in organization and society e.g.: • Education • Job wanted • Living close to work so logistics do not "kill" • If it is possible work part-time • If parental leave is distributed equally • Organizations could make a survey and ask the individual what makes them straining and ask for solutions • Society could make a survey and ask the individual what makes them straining and ask for solutions	Private life, organization and society e.g.: • Bad leadership • Bad working environment • Lack of laws to protect employees and their families e.g. laws enforcing part time jobs when children are young • No official rules / guidelines how to diagnose stress • Psychological help not free of charge • Working too many hours • Not taking breaks • Superior, who does not treat employees well and gives too little support • Bad working environment, bullying • Unhealthy relations • Unsolved conflicts • Not taking care of oneself mentally, physically, no healthy eating and drinking; unhealthy intestinal flora and fauna • Abuse, sickness, death of relatives, divorce • Physically and psychological violence • Present and past effects from traumas in the environment from childhood and adolescence • Present unhealthy behaviour / thought patterns from the environment, from childhood, and adolescence • Personal lifestyle (alcohol, cigarettes) • Lack of exercise Organizations: • The visible and nonvisible factors putting unhealthy pressure on individuals Society: • The visible and non-visible factors that put an unhealthy pressure on the individual

Limitations of this study

The limitations of this study start with the cross-sectional design. As explicated above, causal interferences are not possible. In epidemiology, there are, however, criteria that finally, when they exist, support to argue for causality in correlations. According to Bradford Hill (1965), these are:

1. Strength of correlations – are the associations between schemas and sickness strong enough that it is probably not a coincidence?
2. Consistency – are similar results found in other studies, populations, under different conditions?
3. Specificity – is the effect clearly delimitable?
4. Temporal sequence – is the temporal sequence given, i.e. schema acquired in early childhood, and later as adult sick with stress?
5. Dose-response relationship – the higher the YSQ scores, the more severe the sickness?
6. Plausibility – are causal relationships biologically explainable?
7. Coherence – consistent with current knowledge?
8. Analogy – are here similar causal relationships in other areas?
9. Reversibility – does the remedy of unhealthy schemas help to reduce stress symptoms?
10. Experimental evidence as the ultimate sign of causality – are the results replicated in a longitudinal study with proper control group?

The criteria clearly not true for the current study are 8 and 10. Criterion no. 8, analogy in other areas, cannot be given, as schemas were not studied outside the area of mental sickness and stress. The gold standard for experimental evidence, the longitudinal randomized control trial with proper control group was not followed in the presented design. However, criteria 1-7 and especially 9, reversibility as schema therapy proved to be successful, could at least partly apply: the found associations are strong and consistent (criterion 1). They are also in line with the underlying biological, psychoanalytical, and therapy science models of how mental sickness emerges (criterion 2 and 6). Furthermore, the YSQ reliably distinguishes healthy and unhealthy schemas (criterion 3). Also, the temporal sequence is given, as schemas developed in the past influence future states and not vice versa (criterion 4). There are also studies giving evidence for criterion 5; the higher the YSQ score, the higher the average symptom frequency and / or intensity. Coherence with other current knowledge is also given (criterion 7). Finally,

reversibility of sickness by schema therapy has been proven many times in clinical studies. Thus, the assumed strong connection, maybe even causality, between schemas and stress sickness found in the present study, is supported by the Bradford Hill criteria.

Problems with measuring traits

Schemas are considered a part of personality. In personality measurement, Type 1 (significance, although null hypotheses are true) and Type 2 errors (no significance, although hypotheses are true) are common. Especially short scales and lacking validity in, for example, the Big Five Questionnaires, are drivers of psychometric problems. Researchers often use very abbreviated (e.g., one or two item) measures of personality traits due to convenience for them and their subjects. Patients especially have difficulties to answer long questionnaires in a reliable and valid way. Single-item scales, cause researchers to substantially underestimate the role of traits in influencing behaviour and thereby overestimate the impact of new constructs. That is, the use of very short measures of personality may substantially increase both, Type 1 and Type 2 error. Credé et al. (2012) additionally argue "that even slightly longer measures can substantially increase the validity of research findings without significant inconvenience to the researcher or research participants." As the YSQ has five items per scale, the current data are based on sufficient answers. However, other problems of personality measures remain, for example, social desirability. Finally, as Hobfall (1998) states, these problems are "not a question of whether psychological science should abandon empirical research in favour of a qualitative, descriptive approach. Rather, it is a wake-up call that all approaches to science and knowledge have powerful inherent biases. The moment you look one place for answers, or explore by one method, you begin to ignore other possibilities."

Strengths of this study

The strengths of the presented study can be seen in the – for clinical studies – relatively large client sample. The German Psychological Association (DGPs) investigated 790 psychotherapy studies and found that 50% had less than 50 patients and only 7.8% had more than 100 („50% aller Studien haben einen Gesamt-Stichprobenumfang, der kleiner als 50 ist. Lediglich 7,8% der Studien haben mehr als 100 Patienten", https://www.dgps.de/fachgruppen/methoden/mpr-online/issue3/art7/node6.html. The study here thus definitely belongs to the top 10% of psychotherapy studies.

The second winning strength is that from the beginning the three schemas self-sacrifice, unrelenting standards, and approval-seeking were suspected as the most dangerous. Not expected, but in support of this, were the findings, that i) the other schemas were less powerful in both groups and ii) also the controls had high values in the three focused schemas. This implies also, that (so far) healthy people are most probably at risk to enter the unhealthy range of especially these three schemas and become sick with stress.
A third advantage of the presented scientific work is the inspiration from psychotherapeutic practice. This explains the rip into the heart of the problem as described in the preceding paragraph. Also, the vice versa, theory-to-practice is worth mentioning.

Future challenges

To continue the research and obtain results that can be used to prevent getting sick with stress due to unhealthy schemas is depending on Jeffrey Young's willingness to both, allow the general use of his original questionnaire and the translation into other languages. Moreover, it should be used as part of the workplace health promotion, i.e., beyond context of psychotherapy and psychiatry.

Further research

The ideal design, as outlined above, must be the longitudinal, randomized control sample with the calculated, optimal sample size. Again, the findings of DGPs put it to the point:
„Studien mit zu kleinen oder zu großen Stichprobenumfängen sind aus ethischen aber auch aus ökonomischen Gründen problematisch. Bei zu kleinen Stichproben werden bestehende signifikante Unterschiede zwischen den Studiengruppen nicht erkannt, bei zu großen Stichprobenumfängen werden praktisch irrelevante Wirkungsunterschiede zwischen den Behandlungsgruppen als signifikant ausgewiesen. Die Studien mit zu kleinen Stichprobenumfängen stellen allerdings das weitaus häufigere und größere Problem dar."
https://www.dgps.de/fachgruppen/methoden/mpr-online/issue3/art7/node6.html
Too large samples can also be problematic with respect to ethics (too many patients bothered), economics (too much cost), and also error (overestimated effects).
Apart from sample size, the longitudinal approach is crucial. It should be possible, to further follow the client and the control group until completion of the therapy and beyond – provided that anonymity is enforced by e.g. a data trustee (see chapter on handling sensitive data in http://www.iceatca.com/kerfi/wp-content/uploads/2009/02/93.pdf page 55 printed and 63

electronic). This, however, requires research funding form health organizations, so that data must not be obtained besides full-time work as psychotherapist like in the present case. The research purpose beyond schema therapy was therefore fulfilled as a private matter and took more time than a full-time researcher would have spent. The ultimate goal of future research would be to further develop the YSQ as screening tool for workplace health promotion under ethical considerations and use the results for gaining more knowledge and for improving work / life conditions for everyone.

Conclusion

If I had known before, that the three schemas I had hypotheses about, were the only ones that were significant, I would have been closer to what I originally wanted to achieve in this dissertation, namely, to be able to simplify stress. I wanted to develop a simple screening tool that would predict and therefore facilitate prevention of stress sickness.

But what I found instead was that there were more complex differences between the patient group and the control group not being sick with stress and that these were significant. **Not only** in relation to the 3 schemas I selected, but in **all** of the 17 schemas (except entitlement), the data indicated higher scores in the client group. Thus, the 2 groups are different on 17 out of 18 schemas.

On the good side, this work **found a questionnaire that is valid, reliable, and consistent in differentiating the two groups.** However, the whole questionnaire is needed as all, but one schema is indicative. More research is necessary to find out, what this questionnaire can say about stress beyond the findings in the presented data, and how it can be used as a possible tool to predict and prevent stress sickness.

Although I did not find what I wanted to find, the findings drive on health promotion in private, work, and societal life. To quote one of the statistical experts I consulted, Ylva Lisesdatter, she said when I was expressing my frustration over my results:

“Everybody is looking for ‘the golden key’ (to solve the stress problem) and in the time we live in now, ‘we’ want to remove the complexity, e.g., as with lean processes. **But what you do with your results in this dissertation is that you unfold the whole person again.** Your results in themselves cannot fix anything. Results are just results. There are no good results, there are no bad results. But what you are contributing to is precisely to say that the groups are differentiated on all sorts of different parameters and therefore you can not necessarily with what you have identified boil it down to one model that will ‘fix’ people who are sick

with stress. You kind of found a little nut here but you could not crack it, so let's try to unfold it one more time. That's one of the ways to do it in future research."

When she said that, it totally changed the way I looked at my results. From being frustrated, thinking that it had been very meaningless to have gone through all this hard work, to write this dissertation and having involved a lot of other people just to end up with what I felt was nothing, because I had not been able to find the golden key to the stress solution, it suddenly became very meaningful, because I realized that stress REALLY is very complex, and it is NOT POSSIBLE to simplify it by a simple model and tool. Seeing it from that perspective that I had "unfolded" the "whole person again", I guess that is not so bad after all ❤️.

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Appendix

Project outline

Forskningsprojekt som led i Dr. Phil. Afhandling på "Technische Universität Darmstadt"
v/ Catrine Hovgesen

Projektbeskrivelse: Kendetegn omkring stress ved brug af spørgeskemaer fra schema terapi
Tak fordi du overvejer at deltage i forskningsprojektet.

Hvad er formålet med projektet?
Hensigten er at undersøge om der er fælles schemaer, modes eller dynamikker i indlæringshistorien hos mennesker der bliver syge med stress. Udgangspunktet er spørgeskemaer der anvendes i schema terapi. Schema terapi er udviklet af Professor Jeffrey Young.

Hvad er schema terapi?
Schema terapi er en terapiform der udspringer af Kognitiv terapi. Kognitiv terapi drejer sig om den tætte sammenhæng mellem tanker, følelser, adfærd og fysiologiske reaktioner.

Følgende tre områder er kerneområder i schema terapi:

- Schemaer (mønstre eller livsfælder)
- Modes (tilstande, humør, stemning og adfærd)
- Dynamikker fra indlæringshistorien (beskriver nogle levevilkår her med fokus på mor og far, der kunne danne grundlag for udvikling af schemaer)

Schemaer bliver skabt i opvæksten i tilog med teenageårene og videreudvikles ofte gennem voksenlivet. Når schemaer bliver aktiveret dannes en mode, dvs. at tilstand, humør, stemning og adfærd ændres. Når det sker "spænder det ben" for os i voksenlivet. Det vil sige at man kommer til at gentage usunde handlemønstre.

Eksempel:
Hvis der har været særlige påvirkninger i medens man er voksetop, kan det sætte sig som et særligt mønster i livsfælde. Så kan man blive fanget i et kapret af det og dermed få udløst en mode (let skift i humør, en anden tilstand eller væren). Schemaer og modes beskriver hvad dette handler om.

Hvorfor deltage?
Fordi viden om sammenhængen mellem stress og schemaer, modes og deres baggrund, vil gøre behandlingen af stresslidelser mere specifik og virksom og vil bidrage til at mindske risiko for tilbagefald.

Risikoen i at deltage:
Der er absolut ingen fysiske eller psykisk risiko ved at deltage.

Anonymitet:
Der er 100% anonymitet ved at deltage.
Skemaerne vil blive nummereret og det vil kun være undertegnede der kender til identiteten bag de udfyldte skemaer. De udfyldte skemaer vil blive opbevaret i et aflåst skab i 5 år, hvorefter de vil blive destrueret.

Du siger ja til at:

- udfylde tre skemaer, hhv. "YSQ-S3", "SMI 1.1" og "YPI-R"
- acceptere at der ikke kommer en tilbagemelding til dig.
- underskrive samtykkeerklæringen som er vedlagt.

Har du yderligere spørgsmål må du endelig kontakte mig på: info@psykolog-catrinehovgesen.dk
Jeg håber du beslutter dig for at ville deltage.
Mange tak for din tid og din hjælp til fremtidige stressramte.

Venlig hilsen

Catrine Hovgesen, Forskningsansvarlig

Informed consent

Forskningsprojekt som led i Dr. Phil. Afhandling på "Technische Universität Darmstadt"
v/ Catrine Hovgesen

Samtykkeerklæring

- Undertegnede har læst: "Projektbeskrivelse: Kendetegn omkring stress ved brug af spørgeskemaer fra schema terapi."
- Undertegnede giver hermed forskningslederen Catrine Hovgesen lov til at bruge mine resultater fra spørgeskemaerne YSQ-S3, SMI 1.1 og YPI-R.
- Jeg er indforstået med at jeg ikke får en tilbagemelding.
- Forskningslederen får en kopi af henvisningsårsagen som dokumentation for at deltageren er henvist med stress

Sted og dato: _____

Navn: _____

Underskrift: _____

Project descriptions and flyers for participant acquisition

Forskningsprojekt som led i Dr. Phil. Afhandling på "Technische Universität Darmstadt"
v/ Catrine Hovgesen, Cand.Psych. aut. og Specialist i Klinisk psykologi

Projekt om stress og Schematerapi.

Tak fordi du overvejer at deltage i dette forskningsprojekt.

Mange mennesker er sygemeldt med stress i Danmark. Du kender med stor sandsynlighed en eller flere der er, eller har været sygemed stress. Det har en økonomisk omkostning for samfundet som helhed og for de berørte arbejdspladser. Men den enkelte stresssyge betaler oftest også en stor personlig "pris". En "pris" med f.eks. angst, depression, manglende ressourcer til at håndtere helt almindelige gøremål i hverdagen. Dette er blot et lille udpluk af, hvad konsekvenserne kan være. Derfor er det så vigtigt, at vi, både samfundet, organisationerne og den enkelte får indsigt, viden og "redskaber" til at kunne forebygge, at den enkelte bliver sygemed stress.

Jeg er i gang med en ph.d., der undersøger, om der er fælles faktorer og dynamikker hos mennesker, der bliver sygemed stress, og om det vil være relevant at tage udgangspunkt i metoder disse specifikke faktorer og dynamikker i forhold til behandlingen af stress. De undersøgte faktorer bygger på den kognitive terapiform, der kaldes for "Schematerapi", og som er udviklet af professor Jeffrey Young.

I mit projekt har jeg allerede besvarelser fra en gruppe, der har været sygemeldte med stress og har nu brug for en gruppe, der *ikke* har været sygemeldt med stress, en såkaldt "kontrolgruppe". Det er denne "kontrolgruppe", jeg søger deltagere til.

Kriteriet for at være i "kontrolgruppen" er altså, at du ikke har været sygemeldt med stress.

Hvorfor deltage?

Fordi en mere højagtig viden om en evt. sammenhæng mellem stress og bagvedliggende historiske faktorer, vil kunne gøre behandlingen af stresslidelser mere specifik og virksom og vil bidrage til at mindske risiko for tilbagefald.

Risikoen i at deltage:

Der er ingen fysiske eller psykisk risiko ved at deltage.

Anonymitet:

Alle besvarelser vil blive behandlet fortroligt. Hver besvarelse vil være nummereret, og det vil kun være undertegnede, der kan sammenholde nummer med identiteten.

Du siger ja til at:

- udfylde tre skemaer, hhv. "YSQ-S3", "SMI 1.1" og "YPI-R" og lægge dem i en vedlagt svarkuvert
- underskrive samtykkeerklæringen som er vedlagt
- lægge det tre udfyldte skemaer og samtykkeerklæringen i den vedlagte kuvert og i postkassen, der står i forhallen i C5

Har du yderligere spørgsmål må du endelig kontakte mig på: info@psykolog-catrinehovgesen.dk

Jeg håber, du beslutter dig for at ville deltage, mange tak for din tid og din hjælp til fremtidige stressramte.

Venlig hilsen

Catrine Hovgesen, Cand.Psych.aut. og Specialist i Klinisk psykologi

Forskningsansvarlig

Forskningsprojekt om stress søger deltagere - uden stress

17 Sep 2015

Et Ph.d. projekt om stress er netop gået i gang. Du har mulighed for at bidrage med data til forskningsprojektet som en del af en kontrolgruppe. Eneste kritierie er, at du IKKE har været sygemeldt med stress.

Occupational Health har fået henvendelse fra ph.d-studerende, Catrine Hovgesen, omkring et forskningsprojekt omhandlende stress og hvilke faktorer, der er i spil hos mennesker med stress. Da fysisk og psykisk sundhed er vigtig for LEO Pharma, har Occupational Health valgt at sige ja til at bistå med indsamling af data. Der er brug for 100 respondenter i kontrolgruppen, og vi håber, at mange kolleger har lyst til at deltage. Læs ph.d. studerende Catrine Hovgesens beskrivelse af projektet nedenfor.

Kort beskrivelse af projektet v/ ph.d. studerende Catrine Hovgesen
Du kender med stor sandsynlighed en eller flere der er - eller har været - sygemeldt med stress. Det kan have store konsekvenser for den enkelte i form af sygefravær på arbejdet, belastende symptomer, utryghed og nogle gange udvikling af angst og depression.

I og med at konsekvenserne kan være store, er det vigtigt, at både samfundet, organisationerne og den enkelte, får indsigt, viden og "værktøjer" til at forebygge, håndtere og behandle stress på den mest hensigtsmæssige måde.

Forskningsprojektets baggrund
Bag forskningsprojektet står jeg, Catrine Hovgesen, cand.psych.aut og specialist i klinisk psykologi. Jeg har netop startet et ph.d-projekt, hvor jeg undersøger hvilke faktorer og dynamikker, der er i spil hos mennesker med stress. De undersøgte faktorer bygger på den kognitive terapiform, "Schema therapy", udviklet af professor Jeffrey Young.

I projektet er der allerede besvarelser fra en gruppe, der har været sygemeldt med stress, og der er derfor nu brug for en gruppe, der IKKE har været sygemeldt med stress, en såkaldt "kontrolgruppe". Det er denne kontrolgruppe, der søges deltagere til.

På forhånd tak for din hjælp!

Mange hilsner,
Catrine Hovgesen
Cand.psych.aut og specialist i klinisk psykologi

Hvad, hvor og hvordan:
Dit bidrag omfatter udfyldelse af 3 spørgeskemaer på dansk i papirformat. Besvarelsen af skemaerne vil tage ca. 1 time i alt.

Eidesstattliche Erklärung

Hiermit erkläre ich an Eides statt, dass ich gemäß § 9, Abs.1 der Promotionsordnung der Technischen Universität Darmstadt vom 12. Januar 1990 (in der Fassung der VII. Änderung vom 28. September 2010) die vorliegende Dissertationsschrift selbstständig verfasst und keine anderen als die angegebenen Hilfsmittel verwendet habe. Die Stellen, die anderen Werken im Wortlaut oder dem Sinne nach entnommen sind, habe ich mit Quellenangaben eindeutig als solche kenntlich gemacht.
Die Arbeit wurde bisher keiner anderen Prüfungsbehörde vorgelegt.
Köln, den 15. November 2020

_____

Dipl.-Psych. Catrine Hovgesen